AUG 30 1917
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Advertisers' Index, page 122. Contents, page 47. "Where-to-Buy," page 54.
Engineering Directory, pages 94-95. Classified Advertisements, pages 104-121.

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THE IRON TRADE REVIEW

Vol. LXI Cleveland, August 30, 1917 *No. 9*

Business Co-operation Held Back

Iron and Steel Industry Still Awaits Interpretation of Restraining Clause in Food Control Bill—Application of Sherman Anti-Trust Act to War Boards Now Raised—Confusion Prevails

CONFUSION and doubt virtually have paralyzed the effective war relations of the government and business. Menaced by a heavy fine and imprisonment through the food control bill, iron and steel manufacturers are being obliged to withhold their complete advice and co-operation in the distribution of the products of their industry. In the meantime, Washington is directing its wits and energy to the clearing of the muddle which suddenly has threatened its elaborate war machine. An important new question which complicates the issue pertains to the application of the Sherman anti-trust law to the organization of the advisory boards of manufacturers and business men and the functions which they have been performing. The ruling of the attorney general on this point, as well as his interpretation of the incomprehensible clause in the food control bill still is awaited.

Alter Shell Steel Orders

The conferring of buying authority upon the central purchasing committee of the war munitions board by England, France and Russia, followed by Italy, Belgium and Serbia, is only a formal matter and has no significance as to the one-price proposal. The government's manifest doubt of its legal power to extend its own steel price to its allies leaves a point of advantage with the producers in these negotiations. Whatever future steel buying by the allies in this country will take, it is likely it will entail a minimum of munitions steel. Italy, however, has placed 50,000 tons additional. Advices have come from France that the home output of shell steel has overtaken the supply. This probably will mean a considerable application of the clause in munitions steel contracts whereby a corresponding tonnage of other forms might be substituted if desired. Already this substitution has been put into effect in some cases, and rails, plates and other products have been taken instead. Reports from Canada show a marked contraction of the munition industry and the turning of many plants to new lines of production, some of which are of a non-war character.

Navy Wants Iron Tonnage

Heavy buying of pig iron by the government for use of those plants manufacturing supplies to its order is promised. A new inquiry calls for 20,000 tons of foundry iron for the Emergency Fleet Corp., to go to builders of marine equipment. Part of this is for an eastern works. A 30,000-ton hematite inquiry for Italy, put out through American war committees, still is pending. Various producers are not inclined to quote under the open market upon this, but some resale iron has been obtained.Generally domestic buying in iron is holding back and the market is developing further soft spots, due mainly to reselling activities. Eastern resale basic has gone very low on a valley basis.

The government's constant call for more steel shows how heavily it is depending upon the complete co-operation and support of the industry. The great extent of this demand is measured by the approximately .75 per cent of mill output which some of the largest producers of the country now are furnishing for all branches of war use. In plates and structurals, this amounts to practically 100 per cent. Instances are becoming more frequent where the government has taken over rollings scheduled for private uses. The formal announcement of the complete federal shipping program shows a tonnage of 3,000,000 about to be let, calling for a tremendous additional tonnage of steel. The full program, it is estimated, involves 2,000,000 tons of material. For the American troop lines in France, about 35,000 tons of portable track material have been distributed at some concessions and 10,000 more freight cars are wanted.

Wait for Coke Price

The coke market has reflected the effect of the recent fixing of coal prices. Washington advices show governmental regulation of coke still is in the formative stage, but expectation of corresponding action in this product has checked any buying except for pressing needs. Spot prices have eased off several dollars.

The Iron Trade Review

EDITORIAL

A Masterpiece of Muddling

AN IMPOSSIBLE situation in the war relations of business and the government has arisen at Washington. The deadly and incomprehensible section in the food control bill which forbids manufacturers from lending their best service to their country represents a master stroke of muddling. Unscrupulous politicians and unpractical minds are responsible for it. Unless it is wiped out or nullified and that immediately the confusion which now surrounds what promised to become a fine and efficient war machine, may be extended into chaos. A wealth of unselfish and patriotic effort from the most indispensable class in the making of successful war, the manufacturers and the trained executives, may become scattered and ineffectual. Modern war means organization to the highest degree with every branch functioning smoothly and continuously if the most telling results are to be obtained. It represents the supreme expression of a nation through its man power and industrial forces. There is no conceivably greater test or requirement of coordinated effort, mature experience or sound judgment. Anything that reduces or interferes with the fullest use of such potential strength is nothing more than willful or fatuous obstruction and should not be tolerated.

The present situation is more than absurd. It is positively menacing. Not a moment should be lost in abrogating by presidential edict or in repealing by congressional act the offensive clause. Would that with it, the unseeing, the meddlesome and the vicious elements of congress along with the trucklers to Germany might be swept into the discard. In no other way could the nation display so convincingly its impatience with unpatriotic tactics and its deadly earnestness to wage war to its fullest power.

Human Waste Must Be Reduced

"AND the end is that workmen shall live to enjoy the fruits of his labor; that his mother shall have the comfort of his arm in her age; that his wife shall not be untimely a widow; that his children shall have a father and that cripples and helpless wrecks who were once strong men shall no longer be a by-product of industry." This is the apt expression of the aims directing the work of the National Safety Council as voiced by a member.

Such a statement of principles sound strangely at variance with the main aim of the civilized world at present, that of making war. In the midst of warlike preparations and in the gathering of hosts of young men to be sent forward to risk crippling and death other forces are meeting to conserve man power and serviceability. The Council soon is to meet in New York and will consider means to reduce accidents in industry. Some of the best minds in the country will contribute to this end, including executives, engineers, students of industrial economics, government experts and statisticians.

With thousands of trained men being drawn from the industries to the fighting ranks, others less skilled must assume unfamiliar duties to keep up production. This duty of keeping the army and nation supplied with all essentials is only slightly less important than actual service in the army. To promote the safety of these new workers, employers and scientific authorities will bend their combined efforts. No broader safety work ever has been undertaken than that now under way and this will be brought to a culmination at the approaching congress in New York. Elimination of human waste in productive enterprises never has appeared higher in the scale of importance both from a humanitarian and economic standpoint than under the present conditions of war.

Furnace Difficulties With Coke

SHORTAGE of coke is becoming one of the most impressive factors in the iron and steel business in many sections, if not throughout the entire country. Lack of fuel on the part of some makers of high silicon iron is preventing the production of metal bearing the higher percentage of this element which is essential in the successful utilization of scrap in mixtures. Poor quality of coke is the cause of much high sulphur iron, which has the effect of reducing the production of regular grades. Lack of coke of standard grade is limiting production in many merchant stacks. Some steel company stacks are cold for lack of fuel.

Efforts to obtain coke have led to some peculiar reversals of distribution. Carrying coals to Newcastle has been duplicated by shipments to centers which ordinarily produce an excess and ship to outlying points. One consumer of large tonnages reports a loss in breeze of 25 per cent from ovens to furnace. Even after this loss it has been found in practice that the coke has been too weak to hold the furnace burden and crumbles, making operations difficult.

These conditions obtaining in the summer season when coke ordinarily is easy to obtain forecasts an

The Iron Trade Review

EDITORIAL

unusual winter with almost any contingency likely to arise. Furnace owners are looking forward to great difficulties and are doing what they can to prepare themselves for them. Their opportunities to do so, however, are very limited at the high speed with which production now is going forward.

Another Point of View

WITH some radicals in congress urging taxes of 50, 80, even 100 per cent upon so-called "excess war profits", and with other radicals clamoring for a reduction in commodity prices, it is to be expected that some members of the iron and steel industry are expressing their impatience in no uncertain language. These men, it may be remarked, are not the leaders of those larger industrial corporations against whom so many demagogic attacks have been launched. They are the heads of smaller business enterprises and corporations, many of whom would suffer keenly if some of the present confiscatory proposals were adopted. Here are the views of a veteran blast furnaceman:

"My son is going into the army. I would go myself, only I am so old they wouldn't take me. I have bought Liberty bonds. I have subscribed liberally to the Red Cross. But I won't run my blast furnace for nothing."

This man does not put profits above his love for his son or loyalty to his country. He is standing on a principle into which money does not enter except as a symbol of accomplishment. The stockholders of his company, when they chose him as their president, entrusted him with their interests. For years these stockholders failed to receive any return on their investment and the president has made it his main object in life to put the company on a paying basis. Now the goal is near. Earnings have been conserved and put back into the plant and the affairs of the company have been directed wisely and efficiently. The company is not a war order company and has done little export business. Yet measures aimed at business under the guise of "conscripting war profits" would injure this small enterprise relatively more than they would the larger steel company which has been guilty of the unpardonable offense of furnishing shell steel or barbed wire to our allies to hold back the nation that has become the common enemy of civilization. It is not surprising that this iron manufacturer should set his jaw, determined not to step aside from the principles of justice and freedom that have been the Anglo-Saxons' since the Magna Charta. But undoubtedly his anxiety is premature. Surely fanaticism rampant cannot triumph over reason.

Giving Their Best to the Country

CLOSE co-operation in the army draft by the steel industry is shown by a letter recently received by President T. J. Keenan of the Allegheny county, Pennsylvania, appellate draft board, from a high official of a leading Pittsburgh steel company. "Each man for whom a claim will be put in will be weighed on the scale of his usefulness to the nation in the present crisis," the letter says. The missive was accompanied by an affidavit furnished by the company, establishing the fact that the steel company is a necessary industrial enterprise within the meaning of the act of congress of May 18, 1917, and is engaged in furnishing essential products to the government in the present emergency. A list of these products is given. The letter points out that it will be the policy of the company to claim discharge from military service only for certain skilled and semi-skilled employes who are necessary to the operation of the works. This claim will be made for them only as long as they remain in the company's employ and in their present capacity. No exemption will be asked for common laborers or for clerks, other than the few who represent indispensable links in the operation of the works. In order to assist the board in making decisions upon all claims, the company announces there will be attached to each claim filed, two affidavits—one from the general officer in charge of the branch of the plant in which the employe is enrolled; the other from the party—immediate department superintendent or other officer—having an intimate knowledge of the man's qualifications and the necessity of his being kept in his present position.

The attitude of this company is a patriotic one and unquestionably is representative of the entire steel industry. No doubt the government fully appreciates the vital necessity of the steel industry being kept intact by holding its semi-skilled and skilled laborers at their tasks. Their exemption from service in the battle lines should be assured. They can serve the country best as members of its industrial army. The bitter experience of England at the outbreak of war in calling semi-skilled and skilled laborers from industrial plants is a lesson from which the United States can profit advantageously and it is confidently believed it will do so. Its task in this connection will be made relatively easy because of the attitude of complete co-operation of the iron and steel industry.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 468

PIG IRON

(Delivery this year.)

Bessemer valley	$53.00
Bessemer, Pittsburgh	53.95
Basic, Pittsburgh	50.95 to 52.95
Basic, eastern Pa.	50.00 to 52.00
Basic, Buffalo	54.00 to 55.00
Malleable, Pittsburgh	54.95 to 55.95
Malleable foundry, Chicago	55.00
Malleable foundry, Phila.	56.00 to 58.00
Malleable foundry, Buffalo	54.00 to 55.00
No. 1X, Phila.	55.50 to 56.00
No. 2 foundry, Pittsburgh	54.95 to 55.95
No. 2 foundry, Cleveland	54.00 to 55.00
No. 2 foundry, Ironton	55.00
No. 1 foundry, Chicago	56.00
No. 2 foundry, Chicago	55.00
No. 2X foundry, Phila.	51.50 to 53.50
No. 2X foundry, N. J. tide	51.75 to 53.75
No. 2X foundry, Buffalo	53.00 to 55.00
No. 2 plain, Philadelphia	51.50 to 52.00
No. 2 plain, N. J. tide	51.75 to 52.25
No. 2 plain, Buffalo	52.00 to 54.00
No. 2 southern, Birmingham	47.00 to 49.00
No. 2 southern, Cincinnati	49.90 to 51.90
No. 2 southern, Chicago	50.00 to 54.00
No. 2 southern, Phila. del.	51.50 to 53.50
No. 2 southern, Cleveland	51.00 to 52.00
No. 2 southern, N. Y.	51.25 to 53.25
No. 2 southern, Boston	52.00 to 54.00
No. 2 south. interior, N. E.	53.00 to 55.00
No. 2 southern, St. Louis	51.90 to 53.90
Virginia, No. 2X, furnace	51.00 to 52.00
Virginia, No. 2X, Phila.	53.75 to 54.75
Virginia, No. 2X, Jersey City	54.00 to 55.00
Virginia, No. 2X, Boston	54.25 to 55.25
Gray forge, eastern Pa.	45.00 to 50.00
Gray forge, Pittsburgh	52.95 to 53.95
Gray forge, Birmingham	45.50 to 46.00
Silveries, 8 per cent, furnace	80.00 to 85.00
Silveries, 8 per cent, Chicago	85.00 to 92.50
Low phos. standard, Phila.	92.00 to 93.00
Low phos. Lebanon furnace	83.00 to 85.00
Low phos., Pittsburgh	82.00 to 85.00
Charcoal, Superior, Chicago	59.50 to 62.00
Charcoal, Superior, Buffalo	55.00 to 60.00
Charcoal, Birmingham	55.00 to 60.00

COKE

(At the ovens.)

Connellsville furnace	$13.00 to 13.50
Connellsville furnace, contract	10.00
Connellsville foundry, contract	12.50
Connellsville foundry	13.50 to 14.50
Wise county furnace, contract	10.00 to 11.00
Wise county foundry, contract	11.50 to 12.00
Pocahontas furnace, contract	10.50 to 11.00
New River foundry, contract	13.00
New River furnace, contract	8.50 to 10.00

FERRO ALLOYS

Ferromanganese, prompt	$400.00
Ferromanganese, last half	**375.00 to 400.00**
Spiegeleisen, 20 per cent furnace remainder of year	80.00 to 82.50
Ferrosilicon, 50 per cent, Pitts.	225.00 to 240.00
Ferrosilicon, 50 per cent, Pitts., 1st quarter	150.00 to 165.00
Bessemer ferrosilicon, 9 per cent	$94.00
Bessemer ferrosilicon, 10 per cent	95.00
Bessemer ferrosilicon, 11 per cent	97.50
Bessemer ferrosilicon, 12 per cent	100.00
Bessemer ferrosilicon, 13 per cent	105.00

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O., furnaces.

SEMI-FINISHED MATERIAL

BILLETS

Open hearth, Pittsburgh	$85.00 to 90.00
Open hearth, Philadelphia	90.00 to 100.00
Open hearth, Youngstown	90.00
Bessemer, Pittsburgh	80.00 to 85.00
Bessemer, Youngstown	80.00 to 85.00
Forging, Pittsburgh	125.00
Forging, Philadelphia	125.00
Forging, Chicago	125.00

SHEET BARS

Open hearth, Pittsburgh	$90.00 to 95.00
Open hearth, Youngstown	90.00
Open hearth, Cleveland	90.00 to 95.00
Bessemer, Pittsburgh	90.00
Bessemer, Youngstown	90.00

WIRE RODS, MUCK BAR, SKELP

Wire rods, Pittsburgh	$90.00
Muck bar, Pittsburgh	85.00 to 90.00
Grooved skelp, Pitts., nom.	4.00c to 4.50c
Sheared skelp, Pitts., nom.	4.50c to 5.00c

SHAPES, PLATES AND BARS

Structural shapes, Pitts.	4.50c to 6.00c
Structural shapes, Phila.	4.685c to 5.185c
Structural shapes, N. Y.	4.695c to 5.195c
Structural shapes, Chicago	4.94c to 6.19c
Tank plates, Chicago	8.69c to 10.19c
Tank plates, Pittsburgh	8.00c
Bars, soft steel, Pittsburgh	4.00c to 5.00c
Tank plates, Philadelphia	8.185c to 10.185c
Tank plates, New York	8.195c to 10.195c
Bars, soft steel, Chicago	4.50c
Bars, soft steel, New York	4.695c to 5.195c
Bars, soft steel, Phila.	4.685c to 5.185c
Cotton ties, Pitts., Aug.	$2.12
Bar iron, Chicago	4.50c to 5.00c
Bar iron, Philadelphia	4.685c to 5.185c
Bar Iron, Cleveland	4.50c to 5.00c
Bar iron, New York	4.695c to 5.195c
Bar iron, Pittsburgh	5.25c
Hard steel bars, Chicago	4.25c to 4.50c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh, base	3.75c to 4.00c
Angle bars, Chicago, base	3.25c to 4.00c
Standard bessemer rails, mill	$38.00
Stand. open hearth rails, mill	40.00
Light rails, 25 to 45 lbs., Chic.	70.00
Light rails, 25 to 45 lbs., Pitts.	75.00 to 85.00
Relayers, standard, mill	**38.00 to 40.00**
Relayers, light, Chicago	60.00
Relaying rails, light, St. L.	62.00 to 65.00
Spikes, railroad, Pittsburgh	6.50c to 7.00c
Spikes, railroad, Chicago	4.25c to 5.25c
Track bolts, Pittsburgh	5.50c to 8.00c
Track bolts, Chicago	5.25c to 6.50c
Tie plates, Chicago	$70.00 to 75.00

WIRE PRODUCTS

(Prices of independent makers.)

(To jobbers; retailers 5 cents more.)

Wire nails, Pittsburgh	$4.00
Coated nails, Pittsburgh	4.00
Plain wire, Pittsburgh	3.95
Galvanized wire, Pittsburgh	4.65
Polished staples, Pittsburgh	4.15
Galvanized staples, Pittsburgh	4.85
Barb wire, painted, Pittsburgh	4.15
Barb wire, galvanized, Pitts.	4.85
Cut nails, Pittsburgh	4.50

CHAIN, PILING, STRIP STEEL

Chain, ⅜ in. proof coil, Pitts.	9.00c
Sheet piling, base, Pittsburgh	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 9.00c to 9.50c.

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SHEETS

(In cents per pound.)

SHEET MILL BLACK.

No. 28, open hearth, Pitts.	9.00c to 9.50c
No. 28, bessemer, Pitts.	9.00c to 9.50c
No. 28, open hearth, Chic.	8.94c to 9.19c

TIN MILL, BLACK

No. 28, open hearth, Pitts.	9.00c to 9.50c
No. 28, bessemer, Pitts.	9.00c to 9.50c

GALVANIZED

No. 28, open hearth, Pitts.	10.25c to 11.50c
No. 28, bessemer, Pitts.	10.25c to 11.50c
No. 28, open hearth, Chic.	10.44c to 11.44c

BLUE ANNEALED

No. 10, open hearth, Pitts.	8.50c to 9.00c
No. 10, bessemer, Pitts.	8.50c to 9.00c
No. 10, open hearth, Chic.	8.94c to 9.19c
No. 10, open hearth, Phila.	8.185c

TIN PLATE

(Per 100 lb. box.)

Tin plate, coke base, nom.	$10.00 to 15.00

IRON AND STEEL PIPE

(Prices adopted June 18, 1917.)

Steel

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
¼ to 3, butt	42	28½

Iron.

(Prices adopted June 30, 1917.)

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
⅛ to 1½, butt	33	17

BOILER TUBES

(Price adopted April 2, 1917.)

Steel, 3½ to 4½ inches, l. c. l.	34
Iron, 3½ to 4½ inches, l. c. l.	28

CAST IRON WATER PIPE

(Class B Pipe.)

Four-inch, Chicago	68.50
Six-inch and over, Chicago	65.50
Four-inch, New York	68.50
Six-inch and over, New York	65.50
Four-inch, Birmingham	58.00
Six-in. and over, Birmingham	55.00

Class A pipe is $1 higher than Class B.

HOOPS, BANDS, SHAFTING

Hoops, Pittsburgh	6.00c to 6.50c
Bands, Pittsburgh	6.00c to 6.50c
Shafting, Pittsburgh, carloads	5 off to list

RIVETS

Structural rivets, Pittsburgh	5.25c
Boiler rivets, Pittsburgh	5.35c
Tinner's rivets, Pittsburgh	40 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius.)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter.)

Rolled thread	40 off
Cut thread	35 and 2½ off
Larger or longer	25 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts.)

Rolled thread	40 and 10 off
Cut thread	40
Larger and longer	30
Cold pressed, semi-finished, hexagon nuts	**50, 10 and 5**
Gimlet and cone point lag bolts	40 and 10

NUTS

Hot pressed, square, blank	1.10 off
Hot pressed, square, tapped	1.90 off
Cold pressed, square, blank	1.50 off
Cold pressed, square, tapped	1.25 off
Hot pressed, hexagon, blank	1.90 off
Hot pressed, hexagon, tapped	**1.70 off**
Cold pressed, hexagon, blank	**1.50 off**
Cold pressed, hexagon, tapped	1.25 off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago.)

Quotations on leading products August 29, average for July, 1917, average for May, 1917, and average for August, 1916. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices Aug. 29, 1917.	Average prices July, 1917.	May, 1917.	Aug., 1916
Bessemer pig iron, Pittsburgh..	$53.95	$57.95	$44.95	$21.95
Basic pig iron, Pittsburgh.....	51.95	53.20	42.15	18.95
No. 2 Foundry pig iron, Pitts..	54.95	55.95	43.55	19.45
No. 2 Foundry pig iron, Chic...	55.00	55.00	43.20	19.00
Lake Superior Charcoal, Chicago	59.50	59.50	49.25	19.75
Malleable, Chicago	55.00	55.00	43.20	19.50
Southern No. 2, Birmingham...	48.00	46.00	35.75	13.75
Southern Ohio No. 2, Ironton..	55.00	54.25	38.60	18.50
Basic, eastern Pa.....	51.00	50.75	40.75	19.25
No. 2X Virginia, furnace.....	51.00	52.25	41.00	18.50
No. 2X foundry, Philadelphia..	52.50	54.25	43.25	19.85
Ferro mang., delivered.....	400.00	430.00	425.00	170.00*
Bessemer billets, Pittsburgh....	85.00	100.00	85.00	43.50
Bessemer sheet bars, Pittsburgh	90.00	105.00	88.00	43.50
Open hearth sheet bars, Pitts..	95.00	105.00	88.00	43.50
Open hearth billets, Pittsburgh.	85.00	100.00	85.00	43.50
Steel bars, Pittsburgh.....	4.00	3.85	3.50	2.50
Steel bars, Chicago.....	4.50	4.50	3.49	2.79
Iron bars, Philadelphia.....	4.935	4.759	4.159	2.559
Iron bars, Cleveland, local del'y	4.75	4.50	3.25	2.40

*Seaboard.

	Prices Aug. 29, 1917.	Average prices July, 1917.	May, 1917.	Aug., 1916
Iron bars, Chicago mill.....	$4.50	$4.50	$3.39	$2.35
Beams, Chicago	6.19	4.94	4.34	2.79
Beams, Pittsburgh contract.....	4.50	4.50	4.50	2.50
Beams, Philadelphia	4.935	4.909	4.659	2.699
Tank plates, Pittsburgh.....	8.00	5.65	4.50	2.90
Tank plates, Chicago.....	10.19	9.64	5.49	3.19
Tank plates, Philadelphia.....	10.185	10.159	8.159	3.909
Sheets, blk., No. 28, Pittsburgh	9.00	9.00	7.00	2.90
Sheets, blue anld., No. 10, Pitts.	8.50	8.50	6.65	3.00
Sheets, galv., No. 28, Pittsburgh	10.25	10.25	8.85	4.40
Wire nails, Pittsburgh.....	4.00	4.00	3.50	2.50
Connellsville fur. coke, contract.	10.00	9.65	8.00	2.45
Connellsville fdy. coke, contract.	12.50	12.40	8.50	3.15
Heavy melting steel, Pittsburgh	35.00	40.25	28.40	16.25
Heavy melting steel, eastern Pa.	33.00	37.00	26.00	15.00
Heavy melting steel, Chicago...	33.50	35.50	28.75	15.00
No. 1 wrought, eastern Pa.....	44.50	54.00	42.00	20.00
No. 1 wrought, Chicago.....	36.00	39.25	32.50	15.50
Rerolling rails, Chicago.....	39.50	46.25	36.75	15.75
Car wheels, Chicago.....	31.00	36.75	27.25	12.90

(For Additional Prices See Page 468)

Pig Iron Market Shows Soft Spots

Resale Lots Generally Are Responsible for Lower Prices Though Some Furnace Quotations Are Easier—Eastern Basic Sold West at Low Figure—Italy Collecting Bessemer—Consuming Conditions Are Strong

Pittsburgh, Aug. 28.—Disturbing elements in the market for pig iron has caused it to ease off somewhat during the past week. Apprehension exists in the trade with regard to the forthcoming price fixing policy of the government and this is largely accountable for the condition of the market. Sales of various grades show irregularity, with the exception of foundry and malleable which seem to be steady. Transactions of bessemer and basic iron have involved resale tonnages principally. Two sizeable lots of resale bessemer were purchased at $50, valley, and two other round tonnages were closed at $52, valley, both being for prompt delivery. Furnaces are holding out for $53, valley, for bessemer, but buyers are hesitating to pay this price. A few small sales at this figure are reported and it probably most nearly represents the market for this grade. The 30,000 to 40,000 tons of bessemer for the Italian government is being rounded up. Most of this iron obtained so far has been taken from eastern brokers. Quotations on basic iron range from $50 to $52, valley, although there are some reports that these figures may be shaded. One lot of basic, involving a little more than 1000 tons, has been bought within the past few days from an eastern furnace at a figure equivalent to $45.75, valley. A resale lot of eastern basic also is reported to have been closed at $47.50, valley basis. This iron was somewhat high in phosphorus and the transaction is not taken to be representative of the market. Sales of between 2000 and 3000 tons of malleable iron at $54, valley, and of No. 2 foundry at $54 to $55, valley, are reported.

Not Depressed by Resale Lots

New York, Aug. 28.—Offerings of large tonnages at resale, despite the continued light demand, have had no marked effect on the pig iron market in this district. Consumption continues at a maximum rate, as is borne out by the persistent requests for deliveries from all quarters. The question of deliveries is one which is embarrassing to most of the furnaces, not only because of their sold-up condition, but due to the congestion of freight which makes it possible for the railroads to raise embargoes only intermittently. In fact, the only way for the consumer to be assured of prompt deliveries, is by obtaining a government requisition. So acute has the situation become that many foundries, especially in New England, are endeavoring to secure small government orders in order that they may be entitled to demand preferred shipment. The only business now being placed involves prompt and nearby tonnage. A number of inquiries for round tonnages for the last few months of this year either have been withdrawn or are unacted upon. The single exception is 400 to 500 tons of No. 2X which a New York machinery house is understood to have placed in the west for a subsidiary plant at Grand Haven, Mich. Low stocks have brought many foundries into the market for small prompt tonnages. Such business placed during the week exceeded 5000 tons. Much of this iron originally was destined abroad, but could not be shipped due to the export embargo. In general, the holders have been exceedingly firm and in fact some of them have turned away bids equivalent to $50 to $51, tidewater. Much of this iron is from the south

and has been bringing from $46 to $50. Birmingham, for No. 2, although the inside figure has been exceptional. A good many thousand tons at such points as New Orleans, Savannah, Philadelphia, New York City, etc., still are on the market. The local market may be quoted on the basis of $51 to $53, eastern Pennsylvania furnace, for No. 2X.

Can't Satisfy Consumers

Philadelphia, Aug. 27.—Despite price concessions which are being induced with some makers by the continued lightness of new demand, the pig iron market continues fundamentally strong. This condition is being emphasized by the insistent demand from consumers for delivery of iron on contracts. Not only has consumption not diminished, but the indications are that it is increasing, since melters in some cases are anticipating deliveries. Due to railroad embargoes, as well as to their heavy commitments, the furnaces find it impossible to keep consumers satisfied, with the result that almost every day brings many complaints to the sellers. Lack of iron for nearby use is bringing many plants into the market for small prompt lots. Such demand in the aggregate appears to be sufficient to keep resellers, at least in this district, from offering any radical concessions. Many consumers long ago covered themselves through the first quarter or first half of next year, so that there is no eagerness to buy ahead, especially in view of the prevalent uncertainty as to possible government action. Some large foreign requirements are being inquired for, in the expectation that they will be placed with a minimum of delay. Eastern Pennsylvania No. 2X is quoted at $51 to $53, furnace, for shipment this year. At least two moderate tonnages were sold at $51 and one lot of 1000 tons was offered at this figure. In other cases carload lots went as high as $54.50. The only inquiry for first half is a renewed request from the Lenoir Car Works, Lenoir City, Tenn., for 3000 tons of foundry and special analysis iron. Bessemer iron has been offered around $56, Philadelphia, during the week. Nothing new has developed in basic or low phosphorus.

Buyers Feeling the Market

Buffalo, Aug. 28.—Actual transactions of pig iron are less than a week ago, although the inquiry perceptibly has sharpened during that time. Furnace interests believe this inquiry represents the activities of buyers who wish to obtain some idea of actual price conditions since practically a nominal situation recently has obtained. Furnaces are not anticipating the placing of any considerable business until the price question to be determined by the government and now occupying the attention of the federal trade commission is settled. This situation is not exactly distasteful to the furnaces, as they are fully booked for the present year and further assumption of business in many cases would embarrass them. Buyers are disinclined to make purchases or to contract so far ahead until the government has made some announcement of what it intends to do. Likewise, this condition is causing furnaces to bid cautiously for new business. Furnaces believe a strong buying movement is due when the price situation clears. Among the inquiries was a 1000 ton request for basic from a New England melter. An inquiry for 2000 tons of bessemer from a buyer in eastern Canada still is in the market.

Price Trend is Easier

Cleveland, Aug. 28.—Sales of iron continue very few and those made exhibit a slight tendency toward further price easiness. Prices of $53 to $54, furnace, for No. 2 are made more freely and business is being lost at quotations of $55. The Westinghouse Electric & Mfg. Co. has been the buyer of a moderate tonnage of spot foundry iron for its Cleveland plant. There are reports of lower prices on basic due to resale lots, but some furnace quotations range from $50 to $52, valley. A sale of 800 tons of high sulphur basic was made at $47.50, furnace, and another of high silicon basic of smaller amount at $52, furnace. On an inquiry for 2500 to 5000 tons of malleable for the last half of 1918, producers declined to quote. Sellers in this territory have had brought to their attention the inquiry for 30,000 tons of special bessemer for Italy, which is being handled through war committees of the American government. Generally producers are not inclined to quote less than the open market on this business. The demand for iron shipments remains heavy. Furnaces are working poorly, mainly because of coke trouble.

Chicago Dull But Strong

Chicago, Aug. 29.—Dullness, but not weakness, characterizes the pig iron market in Chicago. Buyers have covered their estimated requirements fairly well through the present year and the first half of 1918. Although local furnaces have practically nothing further to sell before July 1, 1918, occasional small prompt tonnages are being booked. This and such off iron as comes into the market from time to time, with a little resale metal, seem to care for the pressing demand. On prompt local iron, $55, furnace, continues to be the quotation. Southern iron is unchanged. Demand is comparatively small and supply even smaller. For prompt iron, which appears occasionally, $50, Birmingham, is the ruling price. Lake Superior charcoal iron is inactive with occasional car lots being taken at $60, furnace. Producers have practically nothing to offer. High silicon iron is difficult to obtain. Jackson county makers have nothing to offer and Tennessee stacks are well sold. The most recent quotation from the latter offered 7 to 8 per cent at $87.50, 8 to 9 at $89, and bessemer ferrosilicon, 10 to 11 per cent, at $105. These quotations are for immediate delivery and are subject to a freight rate of $2.54 to Chicago. Most of the present demand in the pig iron market is for special quality.

Deliveries are becoming more and more deferred. This is due in part to possible overselling and to reduction in the expected output. The latter condition results from the small supply and the poor quality of coke. As an indication of the size of current inquiry about the most important tonnage now up is 300 tons of foundry for October-November delivery to a creamery supply company in Wisconsin.

Predict Slump in Output

Cincinnati, Aug. 27.—Persons in position to know predict that the August production of pig iron in both the Hanging Rock and southern districts will be much below normal. The weather, uncertainty of coke shipments and the scarcity of labor all have contributed to curtail production. It is also stated that several furnaces in the south soon will blow out for repairs, thus further curtailing the output there. Buying is at a standstill, with only a few carloads changing hands for spot shipment. Some resale iron has been disposed of at $47, Birmingham, but most transactions are made at a higher level. Next year's quotations are hard to obtain, $44 to $46 being named by different dealers, with no contracting being done. Northern foundry is quoted at $55, Ironton, for this year, with no prices out for the first half. Melters are complaining as to delayed shipments from both districts, and in some cases they have suffered considerable inconvenience. Widely divergent quotations are made on the Ohio silvery irons, and some 8 per cent was offered last week below $80 at furnace. The spurt previously

reported has died down, and sales are few and far between.

Consumption is Heavy

St. Louis, Aug. 27.—Both dealers and consumers report virtually no change in the pig iron situation, as contrasted with earlier weeks this month. Government price-fixing of coal and speculation as to what will be done with other commodities has had a deadening effect on iron buying. New inquiries mainly are for small, scattered lots. Leading consumers in this district are well covered by contract, and buying by them is confined to a few odd cars. There has been no change in prices. Certain foundry officials are following the belief that they will be able to secure concessions under current levels later in the year. Producers in the St. Louis district are sold up well into next year. The main strength of the market is the rate of consumption. All the manufacturers are working at capacity, and report their customers in many instances are offering premiums for quick delivery. This is especially true of makers of specialties. Government contracts of various kinds are being booked almost daily, and the story of other business being turned down for lack of plant capacity and raw materials is being repeated.

Watching Government Action

Birmingham, Ala., Aug. 28.—While the lull in pig iron buying for the past four weeks has not disturbed the quotations or strength of the market, considerable apprehension now is felt by the manufacturers in this section as to the probable action of the government in regulating the market and fixing prices. The action in coal is the cause for this. Consumers are waiting to see what the government is going to do as to the price. Those who have contracts are strongly urging delivery, indicating the rate of current consumption. The production in this section is being maintained despite some raw material difficulties, this including both ore and coke. There is some further reduction of stocks. The averting of the threatened strike of coal miners and mine workers through the intervention of the department of labor has removed another source of apprehension which has overhung the market for several weeks. The No. 2 Shelby furnace now is producing regularly. The furnace of the Birmingham Trussville Iron Co. at Trussville, will be ready for the torch about Sept. 8.

A small 1-story building to be used as a machine shop and storage space is to be built by the Spencer Wire Co. at its Spencer plant. The company plans to build the structure itself. A small amount of equipment will be needed.

More Ore Carried

Lake Shipments of Iron Ore and Coal Show Increase

Cleveland, Aug. 28.—The movement of iron ore and coal on the Great Lakes during the past few days has been heavier. Orders from Washington, giving priority to coal shipments over railroads reaching lower lake ports, have not become fully operative, but some beneficial effects have resulted. The coal tonnage shipped last week was the heaviest of the season, but an even higher rate must be reached and maintained to supply the demands of the northwest. Improvement in the coal situation is reflected in the ore movement as cars become more plentiful and boats lose less time in unloading ports. The August ore shipments are thought to approximate closely the record July movement.

Coke Price Drops Steadily

Prompt Furnace Sells Down to $11—Government Price Action Awaited—Navy Buys Foundry, Specifying Low Figure

Pittsburgh, Aug. 28.—Declines in the market for both foundry and furnace coke are being made steadily. One broker reports the purchase of a large tonnage of furnace coke for prompt shipment at $11. Other sales of this grade have been made at $12 to $12.50, ovens. Most transactions, however, were made at $13 to $13.50, ovens. The market for prompt foundry is approximately $1 higher than it is for furnace. The market is behaving as it did last month when furnace went from $17 down to $12 and predictions are being made that prices will be down to $10 soon. Some furnace coke sellers are showing a greater willingness to make contracts. The trade is in an uncertain state by reason of the price fixing policy that the government may adopt. In this connection it has been noticed with interest that the navy recently bought a small tonnage of foundry coke in which the prices specified were $3 to $3.50, ovens. Whether these figures are significant as to what price action the government may finally take is a question. Labor conditions in the coke region have improved this week but the car supply is not satisfactory. Production of coke the week ending Aug. 23 was 350,954 as compared with 341,953 tons the week before, according to *The Connellsville Courier*.

Coal Regulation Affects Prices

Cincinnati, Aug. 28.—The government regulation of coal prices appears to have affected spot foundry coke quotations to a limited extent. A number of carload sales of 72-hour coke were made a week ago around $16 to $16.50 in the different producing fields, but $15 per net ton at oven seems to be the maximum figure today, and even this has been shaded in the Wise county district. Contract figures are unchanged, but little, if any, coke is being sold for future shipment. Furnace coke is dead, and no inquiries are before the trade. New River foundry coke is in better demand in small tonnages, and prices in that district are a trifle firmer than elsewhere. Shipments on contracts are slow in moving, although there is a little improvement reported in the car situation.

Lower Prices in East

Philadelphia, Aug. 27.—Coke offerings in this district have shown an increase during the past week. At the same time prices have declined, due in part to the fixing of the price on coal by President Wilson. Considerable spot furnace coke last week was sold at $15.50, Connellsville ovens, and this was followed by offers today at $14.50, and later by considerable business at $13.50, Connellsville.

Alabama Strike Threat Removed

Birmingham, Ala., Aug. 28.—The threatening strike of United Mine Workers in Alabama has been averted through efforts of Secretary of Labor Wilson. The miners have receded from all demands but have been granted the right to present their grievances through local committees.

Coke producers are not seeking new business as production is just about sufficient to take care of contracts in hand and local needs. The market is very strong and while reports that the manufacturers are asking more than the published quotations, there is no coke to be had even at higher prices. Furnace is quoted at from $6 to $8, though small sales are known to have been made at $10. Foundry openly is listed from $10 to $12.50, but recent car lot sales were made as high as $16. A

consumer in the northwest claims to be unable to get coke as law as $12.50 per ton in this district.

Melters Holding Off

St. Louis, Aug. 25.—There has been an easier trend in the coke market throughout the week, due to a more plentiful supply of cars. The labor situation still leaves much to be desired, however. Most foundries now buying in the open market are willing to accept the stiff spot prices and take their chances on lower contract prices later. Belief in concessions later in the year is based principally upon the fact that the government is expected to take action on coke prices. During the week $13.50 to $15, ovens, was being quoted on Connellsville 72-hour foundry coke, as against $15 and $16 the week before. Under these conditions there is no incentive for melters to buy coke other than what is absolutely necessary to keep going. Consumption is heavy.

Small Activity

Shown by Alloy Market—Spiegel Tonnage Sold at $82.50

New York, Aug. 28.—Very little activity has characterized ferroalloys generally during the week. Some business was done in spiegeleisen. The only purchase of importance, however, was 1000 tons of 18 to 22 per cent metal which was taken by a middle western consumer at $82.50, eastern furnace, for shipment this year. New inquiries are unimportant. Spiegeleisen for next year is quoted nominally at $75, furnace, although it is reported that lower might be done; this position, however, has not been tested recently.

Outside of buying of unimportant tonnages for the latter part of the year, which went at something under $400, delivered, the ferromanganese market has been quiet. Spot is quoted nominally at $400, while the first half of next year is held at $350 to $375.

In 50 per cent ferrosilicon there has been some unimportant buying of spot at around $225 to $235. The market on futures is nominal at $150 to $165, delivered.

Pittsburgh Market is Quiet

Pittsburgh, Aug. 28.—No transactions of importance are reported in the market for ferroalloys. Producers are being pressed for shipments, however. The market shows no signs of weakening. Ferromanganese is quoted at $400 a ton, furnace, for last half shipment; $375 for first quarter and $350 for second quarter. Fifty per cent ferrosilicon is held at $160 to $175, prompt shipment, depending on the quantity purchased. Ten per cent ferrosilicon is quoted at $90 to $95, furnace.

May Boost Chicago Ferro

Chicago, Aug. 29.—Ferromanganese, 80 per cent, from the Chicago stack, is still quoted at $400 for 1917 delivery and $350, furnace, for first half of 1918. This producer is sold solid until the first of the year and has made heavy sales for next year. Present quotations are somewhat under those made by eastern producers and it seems likely an increase may be made shortly to the eastern level.

Semifinished Grows Easy

Despite Strong Fundamental Conditions Small Offerings Depress Prices—Low Billet Quotation—Special Steel Active

Pittsburgh, Aug. 28.—Conditions in the market for billets and sheet bars continue irregular. There can be no question that quotations are easier with further declines in prospect. In the face of this situation producers insist that there is no practical reason for the tapering off of the market. Offerings are understood to be limited, yet the comparatively small tonnages which are available have forced down the market. Producers are well sold up and are being pressed strongly by the government for steel of all kinds. Because of the preference given to the government in making deliveries private buyers are staying out of the market as much as possible but some are in need of billets and sheet bars. Their supplies are said to be unusually low as a general thing. The semifinished market therefore seems to be in an anomalous position. One broker has offered 1500 tons of billets at $75 for prompt delivery. No buyer has as yet been found and it is reported that even this figure, between $5 and $10 below the levels prevailing for billets last week, will be shaded to $70 by the holder is necessary to dispose of the tonnage.

Prices Droop in East

Philadelphia, Aug. 27.—More semifinished steel has been sold in this district during the past week than for some time past. The supply has broadened out extensively, however, so that prices not only are lower, but show considerable variation. Open-hearth forging billets which sold as high as $140 recently, were closed at $125 and $130, eastern Pennsylvania mill, this week. Open-hearth rerollers which recently sold as high as $115 were at $100 in good-sized tonnages this week. At the same time, one large lot of prompt billets was offered at a shade under $80, Pittsburgh, while large tonnages of shell discard billets and slabs can be had around $60, Pittsburgh. Much of the steel offered, it is understood, originally was booked for export but cannot be shipped on account of the embargo. Open-hearth blooms were sold at less than $90, Pittsburgh, during the week. Open-hearth wire rods were offered at $90, Pittsburgh, for export. A round tonnage of hard wire rods was sold above $110, Pittsburgh.

Italy Wants Semifinished

New York, Aug. 28.—The Italian government, which during the past three weeks has inquired at different times for 30,000, 15,000 and 10,000 tons, respectively, of 4 x 4-inch rerolling billets, now is out for 5000 tons. It is believed that this is a revision of the three first mentioned inquiries, which did not result in business.

Despite the rigid embargo which prevents the shipment of plates and other finished steel products to Japan, the mills continue to receive numerous inquiries from that source. Among them is one lot of 2000 tons of bars and 8000 tons of plates.

Most of the new demand from France is for open-hearth wire rods. An order for 1200 tons of No. 2 rods has been placed at $92, New York. French buyers now are in the market for an additional 5000 tons of No. 2 and No. 3, and 3000 to 5000 tons of No. 5 open-hearth wire rods.

Special Steel Demand Intense

Cleveland, Aug. 28.—A remarkable demand for electric and alloy steels continues to feature the semifinished market. Makers are much behind in deliveries. Probably two-thirds of this business originates in war requirements, but producers also are devoting considerable attention to the permanent upbuilding of this branch of business for later peace times. One order for 1000 tons of the latter character was placed. War orders also have been calling for various lots of forging steel. One moderate quantity placed this week is for gun carriages. An inquiry for 5000 tons of piercing billets for the manufacture of seamless boiler tubes, probably for destroyers, is up in this territory. Forging billets continue to demand around $125, mill. A sale of about 500 tons of odds and ends of rerolling billets was made at $85, mill. The sheet bar market still is indefinite, owing to the lack of sales. Makers are talking

over $90 to $95, Pittsburgh. Consumers in this territory are well covered on their nearby requirements and appear in no hurry to place new orders. Recent sales of wire rods have been made at $85, Pittsburgh. An eastern inquiry for 1000 tons of slabs for plate rolling has been before makers for some time.

Makers Fear Cancellations

Pittsburgh, Aug. 28.—Fear that existing contracts for cold rolled strip steel may be cancelled has been expressed by some manufacturers. They are apprehensive that the government may fix prices greatly below those at which contracts have been placed and also because consumers may be so affected by this program that they will be unable to use the material. New business is extremely light. Producers continue to quote prices at 9c to 9.50c, base, Pittsburgh.

Italy Buys Shell Steel

Places 50,000 Tons With Valley Mill Through J. P. Morgan & Co. at 5.75c—International Harvester Specifies Heavily

Pittsburgh, Aug. 28.—Shell steel to the amount of 50,000 tons is involved in a contract just let to the Brier Hill Steel Co. by J. P. Morgan & Co. on behalf of the Italian government. The price on this steel is 5.75c, Youngstown, and deliveries are to begin at once. Among important new inquiries which just have come out is one for a huge tonnage of shell steel for Great Britain and another for several thousand tons of gun barrel rods also for export.

Rollings are Commandeered

Cleveland, Aug. 28.—About 2100 tons of reinforcing bars will be required for the North Hill viaduct, Akron, which now is up for figures. Although some makers of reinforcing bars still hold for 4.25c, mill, it is reported that an attractive tonnage probably could be placed around 3.50c. One lot of several hundred tons of below standard material was placed at less. The government has been commandeering some rollings of large rounds which were intended for automobile builders, causing considerable inconvenience to the latter.

France Wants Truck Steel

Youngstown, O., Aug. 29.—Much tonnage of steel bars is sought by munition makers. The latest inquiry is from the French government for 300 tons to be used in the construction of heavy automobile trucks. The prices quoted are withheld.

Canada Cuts Munition-Making

Buffalo, Aug. 28.—Local selling agencies doing export trade are being affected by important developments in Canadian business during the week, which was the notice sent out by the imperial munitions board that future contracts will be considerably reduced. The manufacture of certain kinds of shells is to be discontinued and the manufacture of other sizes considerably curtailed. This is resulting in many of the machine shops changing over their organization from that of shells to the manufacture of ship parts. This is also calling for some reorganization of the selling forces of steel companies which have been directing much attention to the furnishing of large rounds and other forms of steel for munition manufacture.

Big Tonnage for Fleet

Philadelphia, Aug. 27.—Estimates just completed show that approximately 100 tons of iron and steel bars will be required for each of the merchant vessels to be built for the Emergency Fleet Corp. Nothing yet is known as to when the bar orders will be distributed or on what basis payment is to be made. New demand for bars, is of good proportions. New inquiries, both for iron and steel bars, involve numerous lots ranging from 500 to 2500 tons each. Most of the current demand for iron bars is from bolt, nut and rivet makers. Among sales during the week was 1000 tons of steel bars at 4.75c, eastern Pennsylvania mill. Several lots of soft steel bars aggregating about 1000 tons, were sold for export at 5c, Pittsburgh. Several lots of prompt steel bars were sold at 5c, Pittsburgh. Fairly heavy specifications are being filed against steel bar contracts recently made at 4.50c, Pittsburgh. On a little business as high as 6c was done on iron bars.

Western Makers Well Sold

Chicago, Aug. 28.—Demands by the government on the leading interest and the leading independent have been so heavy that it will be necessary, if a further tonnage is placed with these makers, for the former to specify which material is wanted first and which can be delayed. Both these producers are in a position of having practically nothing to sell except to the government. Even for that destination they have as much as they can handle and give reasonable shipment. Implement makers still are prospective buyers. The bridge shops connected with the leading interest are busy fabricating material for ships to be built under the requirements of the Emergency Ship Corp. Demands for car material for equipment to be sent to France are taking much tonnage in bars as well as in other forms of finished steel. Hard steel bars vary from 4.25c to 5c, Chicago mill, with 4.50c figuring in most sales. The minimum is being made by one interest to balance its rolling schedule and the maximum is obtained on some small local lots. A sale of 600 tons for reinforced concrete work was made recently and is the largest of this sort for some time. Not much inquiry is being received for bar iron outside of government work. However, there is some tentative inquiry on the part of those who have not been able to cover for first half of next year. An order was placed recently for 500 tons to be used in the making of tent irons by a western manufacturer.

Harvester Specifying Heavily

Pittsburgh, Aug. 28.—Heavy specifications against contracts for steel bars are being made by the International Harvester Co. to meet requirements for agricultural implements in 1918. Other consumers are also specifying rather heavily. New business is quiet both for steel and iron bars. Consumers are awaiting the price fixing program of the government before entering the market actively. The market for steel bars continues to be quoted at 4c to 5c, and for common iron bars at 5.25c, Pittsburgh.

Sound Out Shafting Market

Pittsburgh, Aug. 28.—While not much new business has been booked by mills for cold rolled shafting for private consumption, prospective buyers are sounding the market. Mills are engaged on large contracts for the government for the manufacture of munitions, and are not eager for new business. Bookings in some plants will keep them busy until next February or March. The market is quoted at 5 per cent off to list.

Hoops and Bands Quiet

Pittsburgh, Aug. 28.—Quietness continues to rule in the market for hoops and bands, which are quoted at 6c to 6.50c, Pittsburgh. Most makers in this district have withdrawn from the market for the remainder of the year.

Bolt Mills Booked Heavily

Pittsburgh, Aug. 28.—All mills producing nuts, bolts and rivets are booked heavily. Much of the tonnage being turned out is for the government, although that being produced for private consumption is also considerable.

Place Plates for Boats

Emergency Fleet Corp. Distributes 50,000 Tons and Heavy Lots Will Follow—Total Needs Placed at 2,000,000 Tons

Philadelphia, Aug. 27.—Orders totaling approximately 50,000 tons of boat steel, of which two-thirds are plates and the remainder shapes, have been distributed among the leading makers by the Emergency Fleet Corp. The price on this business is not mentioned, being left to future determination. These orders follow closely on the heels of a large tonnage for 36 mine sweepers, the steel for which recently was apportioned among five or six mills, also on the basis of a price to be fixed later. Exceedingly large proportions again are being assumed by the demand for plates in the east. One mill turned away 6000 tons of tank steel for first quarter at 10c, base mill, because it is unable to make delivery; the same maker received an inquiry for 16,000 tons of Lloyd's boat steel on which it submitted no quotation, and an inquiry for 20,000 tons of structural plates for export which it declined even to consider. A new inquiry for 20,000 tons of boat steel for export which is receiving no attention, has just come out. Although most of the mills continue to regard 10c, Pittsburgh, as the minimum on tank steel, it is easy to get a quotation as low as 8c. This figure has been quoted on numerous moderate sized lots the past few days by sellers who have tonnage which they are unable to ship abroad because of the embargo.

Destroyers Take 54,000 Tons

New York, Aug. 28.—It is estimated in well informed sources, that each of the 150 additional torpedo boat destroyers which Secretary Daniels is to place under contract shortly, will require approximately 220 tons of plates and 140 tons of shapes, making a total of 54,000 tons of steel. In addition, steel bars, sheets, tubing and other products will be required for these vessels in considerable quantities.

Total Tonnage Will Be Huge

Pittsburgh, Aug. 28.—Heavy tonnages of plates for additional requirements of the Emergency Fleet Corp. are being placed. The entire program represents approximately 2,000,000 tons of structural material. The large orders which already have been given in recent weeks to the mills some of which are in this district, are to be closely followed by others until the needs for the new merchant marine have been fulfilled. In some instances, the corporation asked for extremely early deliveries and producers requested and were granted concessions so that they could extend the period. These related to tonnages going to plants which have taken contracts for vessels, but have not yet completed their yards and will not be able to use structural steel for some time. The tonnages are being apportioned among the mills according to their capacities and operations. The price to be paid by the government is to be determined later, awaiting the announcement of the President. These levels are to be based upon the cost findings of the federal trade commission. Private buying in this district is extremely quiet. Small tonnages of tank plates have been sold during the past week at a range of 8c to 10c, but the maximum figure seems to have disappeared and the former appears to represent the market.

Ship Plates are Placed

Chicago, Aug. 28.—The leading local independent maker has booked 1500 tons of plates and shapes to be fabricated at Waukesha for ships to be built at Mobile for the Kelly-Atkinson Co. More than 50 per cent of this order is for steel plates. The price quoted is subject to government arrangement.

Government Buys Sheets

Take Further Tonnage for Miscellaneous Needs of Army and Navy—2750 Tons for Stoves Are Closed

Pittsburgh, Aug. 28.—Additional requirements, involving fairly heavy tonnages of sheets have been placed by the government. Various grades are being taken. The material is being placed either directly or indirectly and is for miscellaneous uses such as for the construction of cantonments, mines, tent stoves, ranges, and for the manufacture of kitchen utensils. Private buying is moderate. Consumers are making efforts to bridge over supplies now on hand until books of manufacturers are opened for 1918 business. These new bookings promise to be delayed and may not be made until in November. The comparatively small amount of new business that is being taken by mills for private consumers is for as early shipment as can be made and most producers are taking care of their regular trade in a rather satisfactory manner. Sales have been reported of blue annealed No. 10, Pittsburgh, at 9c to 9.75c; of black sheets No. 28, Pittsburgh, at 8.50c to 10c; and of galvanized sheets No. 28, Pittsburgh, at 10c to 12c.

Place Tonnage for Sweepers

New York, Aug. 28.—Good-sized tonnages of sheets have been distributed among various makers during the past week for use in the construction of mine sweepers and artillery vehicles. Orders for the sheets for the mine sweepers were placed by the Harlan & Hollingsworth Corp., and this material will be used in the construction of 36 vessels of this type at 12 shipyards which have the contracts. It is expected that further tonnage for artillery vehicles will be apportioned before long. The business placed went at the 6.50c, Pittsburgh, price, which some time ago was established in connection with government requirements.

Government Orders Filled

Youngstown, O., Aug. 29.—Governmental buying which dominated the sheet market in the Mahoning valley district lately has shown a declining tendency. The majority of the national contracts have been cleaned up and the mills are working almost entirely on commercial orders so as to have clear decks when their books are opened for 1918 business. New inquiries for sheets from the open trade have fallen off. No large sales are recorded. Buyers who are successful in locating small tonnages do not argue about quotations, but ask when the material will be delivered. Prices remain firm. Galvanized sheets, No. 28 gage, are quoted at 10.25c to 11.50c; black, No. 28 gage, 9c to 9.50c; and blue annealed, No. 10 gage, 8.50c to 9c.

More Eastern Buying Shown

Philadelphia, Aug. 27.—Fair activity has relieved the recent dullness in the sheet market in this district. During the past week numerous lots, involving mainly small tonnages for prompt shipment, have been sold at from 8c to 9c, Pittsburgh, equivalent, at the new freight rate, to 8.185c to 9.185c, Philadelphia, for No. 10 gage blue annealed and No. 28 gage black, respectively. Galvanized sheets have

been dull and are held at 10.50c, Pittsburgh, for domestic consumption, while on a large tonnage for export 11c was quoted. The leading eastern maker quotes 8.50c, Pittsburgh, minimum on shipment this year, and up to 9c on nearby. The sheets involved in sales as low as 8c originally were sold abroad but cannot be shipped due to the export embargo.

Order Tonnage for Stoves

Chicago, Aug. 28.—Steel sheets are being taken in considerable tonnage by various manufacturers having contracts for army ranges and tent heaters. Specifications for this equipment are so simple that many sheet metal manufacturers have undertaken their construction. A western independent recently booked 2750 tons of black sheets for this purpose which will go to several manufacturers. No. 28 gage black sheets are being quoted at 8.94c to 9.19c with some makers receiving as high as 9.69c on small lots. No. 10 gage blue annealed continue at 8.94c to 9.19c, Chicago, and No. 28 galvanized at 10.44c to 11.44c, Chicago.

Expect Big Shape Tonnage

Federal Ship Plants and Further Vessel Construction Loom Large—Government Supplies Steel for Gun Shops

Philadelphia, Aug. 27.—Although the structural steel market still is entirely devoid of lettings of importance, present indications point to a considerable augmentation of the booked tonnage in the near future. The principal requirements which are expected to be disposed of soon are the tonnages for the construction of the three fabricated shipbuilding plants which the Emergency Fleet Corp. is expected to authorize this week. This action, it is expected, will be followed without much delay by the distribution of the shape tonnage which will be required for the vessels to be built. It is expected that a huge tonnage of shapes will be needed for the vessels that will be involved in the new contracts proposed. Present indications also are that the contracts for Philadelphia subway extensions will be let shortly. The steel for this work now is slated to go to the McClintic-Marshall Co. and the American Bridge Co., 14,000 tons to the former and 7000 tons to the latter. It is reported, but not verified, that held-up tonnages of shapes originally booked for export have been offered at concessions, in some cases as low as 4c, Pittsburgh.

Private Demand at Low Ebb

New York, Aug. 28.—Demand for structural steel for ordinary building purposes now is at the lowest ebb in months. There is practically no demand in metropolitan territory for anything outside of government requirements, and railroad, bridge or plant extensions. Some of the eastern fabricators report that their plants now are operating at less than 25 per cent of capacity. The Federal Shipbuilding Corp., recently organized as a subsidiary to the United States Steel Corp., has placed orders for more than 8000 tons with its sister subsidiary, the American Bridge Co., for the construction of its new shipyard on the Hackensack meadows in New Jersey. Rumors of a decline in the price of shapes to 4c, Pittsburgh, which have been circulated among builders here, are without foundation. In this district the minimum for shipment at mill's convenience still is 4.50c, Pittsburgh, equivalent to 4.695c, New York. Small lots for preferred delivery have been going as high as 5c, Pittsburgh. Export demand has shown a decided decrease. One mill whose export inquiries were averaging 50,000 to 60,000 tons monthly, has had inquiries from abroad for only about 1500 tons during August.

New Fabricating Orders Lacking

Pittsburgh, Aug. 28.—Dullness in the way of new business continues to characterize the market for shapes. Fabricators in this district are well filled with orders for the remainder of the year and have large government bookings. Prospective buyers are hesitating about putting out inquiries until after the administration at Washington has fixed prices. After that considerable impetus is expected to be given to the buying movement by private consumers. Prices remain unchanged.

Government Furnishes Structural

Cleveland, Aug. 28.—A recent inquiry for 4000 to 6000 tons of shapes for an extension to an industrial plant in this territory to accommodate the manufacture of large guns, has been disposed of. The government is erecting the required buildings and is seeing that the construction steel is being provided. Among war orders recently placed have been lots of channels by manufacturers who are taking up the building of gun carriages. The open market is bereft of private work and most of the mills do not care to entertain any business of this kind under present conditions.

Ship Tonnage Placed

Chicago, Aug. 28.—Aside from about 7000 tons of structurals for shipbuilding placed by the Kelly-Atkinson Co. for 18 ships to be built at Mobile, no large tonnages have been placed in the west recently. This will be fabricated by the Federal Bridge Co. at Waukesha, Wis. The Elgin, Joliet & Eastern railroad has ordered 405 tons to be used in building steel dump cars at its own shops. Prices on plain material are difficult to gage, as demand for government purposes is taking most of the material now available.

CONTRACTS PLACED.

New power house for Eastern Wisconsin Electric Co., Sheboygan, Wis., 210 tons to the Northwestern Bridge & Iron Co., Milwaukee.

Coal pier for Central railroad of New Jersey at Jersey City, 200 tons, to an independent fabricator.

Repairs to Richmond plant of American Locomotive Co., 200 tons, to Richmond Structural Steel Co.

Miscellaneous steel work for Elgin, Joliet & Eastern Railway Co., Joliet, Ill., 405 tons to American Bridge Co.

Industrial building for Moline Forging & Mfg. Co., Moline, Ill., 335 tons to Rochester Bridge Co., Rochester, Ind.

CONTRACTS PENDING.

Ward buildings No. 2 and No. 4 for City of Chicago contagious disease hospital, 600 tons, bids being taken.

North Hill viaduct, Akron, 2100 tons reinforcing bars, bids being taken.

Six magazine buildings and storehouses for the government at Hingham, Fort Mifflin, Lake Denmark and Charleston, 600 tons, bids being taken.

Central light, heat and power plant for government at Washington, 2200 tons, bids being taken until Sept. 23.

Bridge for New York Central railroad at Tonawanda, N. Y., 1000 tons, bids being taken.

Bridges for Pennsylvania railroad, 200 tons, bids being taken.

Heads New Plane Concern

Charles E. Thompson, president of the Steel Products Co., Cleveland, has been chosen president of the new $2,500,000 airplane company, which proposes to build a plant in Cleveland. Glenn L. Martin has resigned as vice president of the Wright-Martin Aircraft Co., New York, to become vice president and general manager of the Cleveland concern. Stock has been placed on the market and operations are expected to begin shortly.

The La Belle Iron Works, Steubenville, O., has bought 2500 acres of coal land in Ohio and Brooke counties, W. Va.

Trench Track Work Placed

Government Orders About 35,000 Tons for Portable Lines in France—10,000 More Cars Are Wanted

Cleveland, Aug. 28.—Distribution of orders for 35,000 to 36,000 tons of 25-pound rails and fastenings for about 700 miles of portable track, to be constructed behind the battle front in France, have been distributed by the government. The track work has been equally divided between the Lakewood Engineering Co. and the Lorain Steel Co. For the former order, the Cambria Steel Co. will supply 8000 tons of light rails and accessories and the Lackawanna and Bethlehem Steel companies, 3000 to 4000 tons each. Steel Corporation mills will furnish the material for the Lorain Steel portion of the contract. The complete order calls for about 23,000 tons of rails and approximately 13,000 tons of steel ties. The latter, in form, are practically a sheet bar. Shipment will be made as rapidly as possible so as to clear the way for the placing of an additional order of the same kind representing approximately 25,000 to 30,000 tons, for the French government direct. This latter order is expected to be placed toward the close of the year. The prices obtained by the government for the track material have not been announced, but are understood to represent some concessions. An inquiry for 500 tons of 12-pound rails for Japan has appeared in this district.

Jobbers Buying Spikes

Pittsburgh, Aug. 28.—Jobbers are taking fairly good lots of spikes from mills in this district. Some contracts are being placed at 7c base. Extremely heavy demand exists for material for boats and barges and some makers are out of the market and deferred deliveries of from five to six months are not uncommon. A great portion of the business continues to be taken to meet requirements of the government.

Government Asks More Cars

Chicago, Aug. 28.—Inquiry for about 10,000 additional cars for the railroad system being built in France by the United States government has come out. The former order for 6000 cars, which was increased to 9000, has been further enlarged by the placing of 500 small push cars with the Pressed Steel Car Co. and 500 convertible ballast cars with the American Car & Foundry Co. Of these 10,000 cars placed western shops will build 4000. A western independent has taken an order for 7250 kegs of spikes for the government railroad. An inquiry is now out for 3850 tons of tie plates of which 500,000 plates are desired for immediate delivery and 70,000 per month for six months will be necessary to complete the entire order. The leading interest has taken an order said to be nearly 25,000 tons for light rails and fastenings for the government to use in France. This material is for the construction of portable tracks behind the trenches.

The Chicago & Alton railroad has ordered 200 gondola car bodies and the Semet-Solvay Co., Syracuse, N. Y., 100 hopper cars from the Haskell & Barker Car Co.

Mixed Conditions in Scrap

Carnegie Steel Co. Buys Round Tonnage But Price Does Not Hold —Weakness in Some Districts—Embargoes Easier

COMPLETE SCRAP PRICES ON PAGE 468

Pittsburgh, Aug. 28.—Higher quotations are being asked by dealers for scrap material. Large tonnages are involved in inquiries and stocks at dealers' yards are reported to be low. Less difficulty is being experienced in moving scrap since the railroads are freely allowing shipments through the issuance of special permits. The embargo of the Pittsburgh Steel Co. has been lifted. The largest transaction of the week called for 11,000 tons of heavy melting steel taken by the Carnegie Steel Co. at $38, delivered at its plant at Munhall, Pa. The tonnage was distributed among several dealers in this district. The figure paid is about $3 a ton higher than the prices now being quoted by most dealers. The sale did not have any appreciable effect on the market. The Pennsylvania railroad has issued two lists. One calls for about 8500 tons of numerous grades, the heaviest item involving about 1500 tons of No. 1 miscellaneous steel. The other list calls for 1150 tons of old steel rails and an unimportant tonnage of girder rails and steel splices.

Pittsburgh Pays Higher in East

New York, Aug. 28.—Additional sales of heavy melting steel scrap in this district to western Pennsylvania consumers have stiffened prices about $1 a ton on this business. The prevailing quotation now is $35, delivered Pittsburgh, for No. 1 heavy melting steel. Inquiry from eastern consumers of steel scrap remains extremely light. While the traffic situation continues to handicap the market greatly, dealers are finding it easier to obtain permits to ship all Pennsylvania railroad consuming points except Coatesville.

Outside Inquiry is Considerable

Buffalo, Aug. 28.—The local scrap market is not what might be termed active at present, though considerable inquiry is coming from Pittsburgh and valley points for heavy melting steel, No. 1 bushelling, machine shop turnings, heavy axle turnings, cast borings and car wheels. As high as $36, delivered, has been offered at these points for heavy melting steel and it has been effective in increasing the local price here to $33 and $34. Dealers are not keen on contracting except for what material they have on hand. The reason for this is that stocks of scrap generally are low and it is difficult to cover sales. The Pennsylvania railroad embargo which is now running into its second week remains a serious handicap to dealers having material for the affected points.

Steel Spurt Short-Lived

Philadelphia, Aug. 27.—A brief spurt in heavy melting steel was the principal development in the scrap market in this district during the past week. This resulted from the recent buying by the Pittsburgh district which has induced numerous dealers here to come into the market for material due on contracts. The dealers paid as high as $34, delivered eastern Pennsylvania, but the movement was of short duration. The market now is softer and heavy melting steel may be quoted nominally at $32.50 to $33.50. Last week Pittsburgh dealers paid as high as $37, delivered, for heavy melting steel in this district, but this demand now has disappeared. Other grades are exceedingly dull and in fact all prices are nominal. Rejections continue numerous, but not as much so as in previous weeks. This is due to the fact that the Pennsylvania railroad embargo on scrap for all points on its lines has resulted in a marked falling off of shipments. Hence consumers are inclined to be less exacting. Although this embargo continues in force, the

dealers are able to secure modifications in connection with points at which there is no congestion.

Clearing Decks for Action

Cleveland, Aug. 28.—Scrap producers, consumers and dealers alike are clearing their decks for better business. Consumers' stocks are believed to be running so low that buying within a short time will be necessary. In view of prospects, and in spite of the uncertainty engendered at Washington, the market is sentimentally stronger, although as yet only a few changes in the price list have been made and none of them important. Transportation conditions are improved this week. The Pennsylvania has lifted its embargo upon shipments to Pittsburgh. The embargoes east of Pittsburgh still are in effect, however. Shipments west and south are free. Only two local plants are under the ban. At present only a very light demand for any grade is apparent.

Chicago Scrap Quiet

Chicago, Aug. 28.—Trading in iron and steel scrap in the Chicago market continues slack, but some buying is being done by consumers to fill out their reserves, which in some cases have fallen low. Indications are for higher prices and the expectation of government regulation seems to be having less effect than formerly. Prices remain at practically the same level, changes being mostly readjustments. Railroad offerings continue light.

Advances Not Maintained

Cincinnati, Aug. 27.—Recent advances in iron and steel scrap have not been maintained. While no radical changes have been made, prices are weak and would be shaded on desirable business. The steel mills are not doing any new contracting, but are urging shipments on former purchases. Wrought scrap is holding up better than cast. Relaying rails represent one grade of old material that shows no inclination to weaken.

Some Signs of Revival

St. Louis, Aug. 25.—While buying of scrap iron and steel during the past week has not been of impressive volume, the situation appears considerably brighter. The chief sign of improvement is in the fact that consumers are putting out feelers for material for the first time in several weeks. Many of the more important consumers apparently realize they have remained aloof from the market too long, and now find prices turning upward. Heavy melting steel, which is scarce, has advanced $4 to $5 during the past few days. Relaying rails are also strongly on the upturn, sales as high as $70 per ton having been reported for first class standard sections.

Hope for Better Conditions

Birmingham, Ala., Aug. 28.—Weakness still marks iron and steel scrap in the south. Sales neither are numerous nor in any sizeable lots. A tremendous stock of scrap is in dealers' yards here and some of the larger consumers still are taking their time in unloading cars of the material being delivered on contracts. But few price changes have been made during the past week. Heavy melting steel is bringing a little better figure. The selected product is commanding as high as $20.25. Larger consumers say recovery of market conditions is likely to appear in other sections of the country more quickly than in the Birmingham district. Some inquiry is being made as to a parity between prices in this district and those existing in Philadelphia and other eastern points.

Rush Orders

For Government Keeps Cast Pipe Plants Full—Open Market Dull

New York, Aug. 28.—Now that most of the government requirements of cast iron pipe for cantonment sites have been placed, the market is comparatively dull. The only new government requirement now awaited is the pipe for the camp at Tenafly, N. J. The plan now is to install mostly wood pipe at this site, although approximately 100 tons of iron pipe also will be used. Private buying is rather small, although inquiries are fairly numerous. Inquiries involve nothing over 250 to 300 tons each. It has been some time since there has been any municipal buying of importance in the east. Quotations continue unchanged at $65.50, New York, for 6-inch, class B and $68.50 for 4-inch, class B.

Considers Prices Too High

Chicago, Aug. 28.—On a recent inquiry for 1300 tons of cast iron pipe the city of Minneapolis has rejected all bids, as too high. This was the only municipal inquiry of importance.

Gets Culverts for France

Birmingham, Ala., Aug. 28.—Cast iron pipe makers in the south are keeping at their melt and shipments are steady. The government business offered for cantonment use throughout the south is being rushed through. Several municipal orders also are being worked on. Cast iron pipe prices range between $60 and $63 per ton, for 6 and 4-inch, respectively. Foundries and machine shops in the Birmingham district are receiving a number of orders directly and indirectly from the government. The American Casting Co. has a $1,000,000 order for iron culverts to be used in railroad repairing and construction in France. The United States government placed the business and fixed the price.

Tin Plate Embargo

Is Expected, But Market Effect Likely to Be Slight

Pittsburgh, Aug. 28.—Reports have reached the trade here that the government within a week or ten days will declare an embargo against shipments of tin plate for export. This proposal is in line with the general policy of the government to conserve its supply of steel and in this particular instance is a part of the food conservation program. Fair-sized tonnages of tin plate are understood to be going to South America, Japan, Scandinavian countries and Italy. Premium prices have been received on export shipments of tin plate. The effect of the embargo on the market probably will be unimportant if it is reflected at all. The principal purpose of this ban against export shipments will be to make available a greater supply of tin plate to be used for food containers.

Stock Plate at $14

Philadelphia, Aug. 27.—Small lots of tin plate have been sold here off stock lists at around $14 per base box, Pittsburgh, during the past week.

Inquiries Grow Heavier

Youngstown, O., Aug. 29.—Manufacturers of tinplate in the Mahoning valley report inquiries which previously were decreasing now are coming out more freely. The prices of unassorted sizes of tinplate continue to soar in proportion to the "primes" and are quoted from $10 to $12 per base box. The government still is buying, although not so extensively as heretofore. It is understood that the average price being paid by the government is $8.50 per base box.

To Build Aircraft

The Standard Aero Corp. has purchased the former plant of the John Stephenson Co., Elizabeth, N. J., and plans to make it one of the largest airplane plants in the world. Present plans contemplate the manufacture of 60 airplanes a week. The new plant is to be equipped with machinery from the present plant of the Standard company, Plainfield, N. J.

Anti-Trust Law Adds to Confusion

Attorney General Called Upon to Interpret Application of Sherman Act to Win Co-operation of Business Men Along With Prohibiting Clause in Pure Food Bill—Defense Council Moves Cautiously

WASHINGTON, Aug. 28.—To the uncertainty surrounding the co-operation with the government by the subcommittees of the council of national defense because of Section 3 of the food control bill has been added a new and similar complexity developed by the possible application of the Sherman anti-trust law to the situation. The combination of these two measures indicates the broadest interpretation possible will have to be given by Attorney General Gregory before the machinery of the council can get into proper working order.

An astounding feature of the complication is that the council of national defense, after its months of operation, has no definite idea as to what it really expects the committees to do, even though they have been doing something. This developed when the problem came for proper presentation of the legal difficulties to the attorney general for his construction of Section 3 of the food bill. That this new situation is even more complicated by the possible meaning of the Sherman act goes without saying.

Baruch Asks Gregory's Opinion

Director W. S. Gifford of the council and its advisory commission, has taken over the question of the meaning of the two measures and will submit it to Mr. Gregory. Bernard M. Baruch, chairman of the raw materials committee of the advisory commission and in charge of this branch of the war industries board, asked Mr. Gregory for his opinion of the food control bill clause when members of his various subcommittees, including that of the American Iron and Steel Institute, tendered tentative resignations on advice of counsel. When it developed other members of the commission were confronted by the same predicament, all agreed to have Mr. Gifford put the joint problem to Mr. Gregory.

As yet, Mr. Gifford has not submitted the matter to the attorney general, and, it was learned on good authority today, the war industries board and the council of national defense, aided by various committees, will have to provide a memorandum showing what the actual duties of the subcommittees are, what the method of procedure of each is and turn this information over to Mr. Gifford. The director undoubtedly will have to take charge of collecting this data, a proceeding that may take some time. This information will then be submitted to Mr. Gregory with the request for a decision on both the food bill and the Sherman law.

The new complication caused by the addition of the Sherman act to the amazing situation created by the general interpretation of the food bill's clause developed when discussion of that clause gave rise to the question of whether the advice of committee members and their recommendation of prices violates the law. The question then arose whether a joint recommendation of a price by a group of men in the same trade is a violation of the Sherman law. Recommendation of a price clearly is not the fixing of a price, but it is a known fact that for months recommendations of prices for purchases by the navy department have been varied and offered in different ways to prevent the possible inference that continuous recommendation becomes a violation of the law.

The situation is such that no one really knows what to do. Work of the council is going on as usual, it is said at the council's headquarters, but it certainly is with the utmost caution and care so that the provisions of Section 3 cannot be invoked against the members who, by the penalty fixed, face a possible five-year prison term and a $10,000 fine.

Mr. Gifford's opinion of Section 3 is that it is really a protection to the subcommittee members and not a hindrance in giving the government the benefit of their expert knowledge and advice on the vital question of war materials. He points out that the members of the committees, who might benefit by transactions recommended to the government, do not come in contact wth the actual purchasing officials of the government, but submit their findings and recommendations to the war industries board, which goes over the reports and informs the officials on matters on which they previously had requested the information. The war industries board members have either renounced their holdings as covered by the food control act's section or else do not recommend business for their own companies, it is pointed out. Nothing of significance is seen in Mr. Baruch's recent selling of his seat on the New York stock exchange other than the severing of business connections and the giving of himself over to official life. In this connection it is pointed out that none of the board, commission or any of the committee do any buying for the government. That is why the industries board exists and why the section was put in, to prevent deliberate business-getting at the expense of the government.

Producers Await Word of Attorney General

Pittsburgh, Aug. 27.—Tentative withdrawal of steel manufacturers as members of committees of the council of national defense who were serving the government in connection with its work of placing war orders has caused considerable concern in this district. These resignations which are provisional and are due to the incomprehensible clause in the food control bill which provides that they may co-operate with the government at their peril. Pending legal interpretation of the clause by the attorney general, the resignations will remain in effect. In the event the attorney general finds the manufacturers are not subject to prosecution under the bill most, if not all of them, will recall their resignations and again take up their patriotic duties. Some, however, are insisting that the clause in the food act be repealed by congress in order to remove any doubt as to their status as members of government committees.

Those who have resigned tentatively have been devoting the time they heretofore have been giving to the government to their own business. But they realize that unless unbroken assistance is given the government the effect on it in its efforts to build up a war machine will be extremely serious.

One large manufacturer of general steel products said that if the services of the producers are withheld from the government long its work will become chaotic. A plate producer blamed the situation on politicians in congress and said they would have to remedy their blunder at once by repealing the offending clause. A steel bar manufacturer declared that not

only will the government imperil its power to conduct the war without the active co-operation of steelmakers, but also that the industry itself will suffer. He pointed out that without counsel and advice from manufacturers the government will not be able to place orders intelligently, the consequence being that some mills will be overwhelmed with federal requirements, while others will escape being given their just allotments. A manufacturer of sheets pointed out a similar situation and amplified this phase by saying the advice of manufacturers is needed not only to provide equitable distribution of tonnages, but also to place them to best serve the needs of the government; that is, if early delivery is not required, mills would not be asked to fill orders quickly, but could devote operations to the pressing war orders, or, if possible, take better care of private consumers.

Further Advances

In Freight Rates on Iron and Steel are Announced

Further advances in freight rates on pig iron, semifinished and finished steel products are being announced by the railroads. Effective Aug. 27, the rate on finished steel, per 100 pounds, from Pittsburgh to St. Paul, will be 31.5c, and to Duluth and western Ontario points, 26.5c. The railroads also have notified the shippers that increases of 15 per cent in joint rates will be made Sept. 15, and in local rates, Oct. 1.

The new rates on finished steel and billets, per 100 pounds, effective Aug. 20, from Pittsburgh to leading points, are as follows:

	Finished	Semi-finished
Boston	$0.215	$3.60
New York	.195	3.20
Philadelphia	.185	3.20
Baltimore	.18	2.90
Utica	.18	2.90
Syracuse	.165	2.70
Rochester	.14	2.30

Virginia cities, such as Norfolk, which formerly took 21.3 cents on finished steel, now take 24.5 cents. The billet rate is $3.40.

The export rates from Pittsburgh, to Philadelphia, Baltimore and New York are the same as the domestic. The export rate to Boston on finished steel, however, is 19.5 cents for 100 pounds and to Norfolk, 21.5 cents.

Some further new rates on pig iron, effective Aug. 20, are: From Buffalo to Boston, $3.10; from Ironton, Hanging Rock, and Jackson to Boston, $4.80, and to Philadelphia, $4.

The Roberts & Schaefer Co., Chicago, has been given contracts for several coaling plants by railroads as follows: Texas & Pacific railroad, 400 tons, Mingus, Tex.; Elgin, Joliet & Eastern railroad, 150 tons, Illinois Steel Works, South Chicago; Oregon Short Line railroad, two 150 tons, at Dillon and Melrose, Mont.; Chicago Short Line railroad, 100 tons, South Chicago; Pennsylvania railroad, 500 tons, Indianapolis; Monongahela railroad 200 tons, Brownsville, Pa.

Falling Off

Of Munition Plant Activities in Canada Continue as Orders Shrink

Toronto, Can., Aug. 27.—The Canadian munitions industry has experienced a considerable falling off, as the Imperial Munitions Board at Ottawa has been advised by the British minister of munitions that production in Canada will not be continued on the former scale. Certain classes of shells no longer are required, and others will only be ordered in smaller quantities. The plants producing the sizes of shells for which orders have been discontinued are closing down, and others are curtailing their forces. The larger Toronto establishments have discontinued their night shifts and have laid off large numbers of the men and women employed. The gradual reduction of staffs has been in progress for some time, as the decrease in orders was anticipated. When the munition industry was in full swing the number of men and women employed was estimated at 200,000, the number recently engaged in the work at the Toronto plants being upwards of 22,000. The curtailment of operations throughout the country will, it is estimated, result in the displacement of approximately 75,000 munition workers and proportionately increase the supply of labor available for other industries.

The large companies in Toronto which are in the munition business are arranging to resume their former activities or are looking for new lines. The expansion of the shipbuilding industry will, it is anticipated, encourage some of the munition plants to engage in the manufacture of such requirements.

Starts Seventh Furnace

Theodore Swann, president of the Southern Manganese Co., announces that the seventh electric furnace now is in operation. Consideration is being given by Mr. Swann to a proposition to erect a plant between Birmingham and Bessemer and about six miles below the former city. The company is importing manganese ore from South America and India.

Shipyard Strikes

Are Settled by Agreement—New Government Board Named

Washington, Aug. 28.—Settlement of shipyard strikes, in effect and threatened, by an agreement made here last week was the third move in two weeks designed to smooth over labor troubles and enable government work to go forward without embarrassing delay. This new agreement calls for a committee of three, to be increased to four when navy work is involved, to adjust differences that would tie up the building program of the Emergency Fleet Corp.

President Wilson immediately named V. Everit Macy, president of the National Civic Federation, as chairman of the committee and left the appointment of the other two members to Samuel Gompers, president of the American Federation of Labor and chairman of the labor branch of the council of national defense's advisory committee, and to Admiral W. L. Capps, general manager of the fleet corporation. When navy department work is affected, Franklin D. Roosevelt, assistant secretary of the navy, will sit with the committee.

The shipyard strike settlement puts the 12,000 men on strike in and around New York back at work and halts a threatened walkout on the Pacific coast in which close to 100,000 men and 750,000 tons of ships would have been involved. The agreement was signed by the following: Franklin D. Roosevelt, acting secretary of the navy; Edward N. Hurley, chairman United States shipping board W. L. Capps, general manager, Emergency Fleet Corp.; James O'Connell, president, metal trades department, A. F. of L.; William H. Johnston, president, International Association of Machinists; A. J. Berres, secretary-treasurer, metal trades department, A. F. of L.; Samuel Gompers, president of the American Federation of Labor; Joseph F. Valentin, president, International Molders' Union; Theobold M. Guerin, representing the United Brotherhood of Carpenters and Joiners; John M. Donlin, president, Building Trades Department, A. F. of L.; John R. Alpine, president, United Association of Plumbers and Steam Fitters; Milton Snellings, president, International Union of Steam and Operating Engineers; Joseph A. Franklin, president, International Brotherhood of Boilermakers and Iron Shipbuilders; James Wilson, president, Patternmakers' League of America, and J. W. Kline, president of the International Brotherhood of Blacksmiths and Helpers of America.

Name Steel Men to Buy

J. L. Replogle Appointed to Direct Purchase and Distribution of Material—Alexander Legge Also to Act

New York, Aug. 29.—J. Leonard Replogle, chairman of the Wharton Steel Co., it is announced from Washington today, has been appointed by the war advisory board as steel advisor. He will not only direct purchases of steel for war purposes, but will determine the order of priority in filling and shipping war steel requirements. His office will be in the Munsey building, Washington.

Mr. Replogle is one of the foremost leaders of the younger school of iron and steel men. He has had a wide training in manufacturing, sales and production capacities, largely with the Cambria Steel Co., which eminently fits him for his new duties and will enlist the full confidence of the industry in the performance of his duties.

Announcement also is made that Alexander Legge, general manager of the International Harvester Co. has been appointed by President Wilson to join in the purchase of steel for the United States government and its allies.

Mr. Legge is 51 years old and has been an employe of the International Harvester Co. ever since its organiation. He entered the service of the McCormick Harvester Machine Co. in 1891 in the collection and sales department, and on the formation of the larger corporation entered its general offices in which he rose from a minor position to that of general manager. In that capacity he has come in close contact with the production and purchase of steel and a wide variety of other raw and finished materials. He has had oversight of the Wisconsin Steel Co., an important producer in the west and a subsidiary of the International Harvester Co.

It has been stated that Mr. Legge will be in charge of a department under B. M. Baruch, general purchasing agent of the war industries board, and will have under him a director of steel purchases and another in charge of copper.

Prices Decline

Late Offerings of Furnace Coke at Pittsburgh Show Further Drop

Pittsburgh, Aug. 29. (special Wire.)—Offerings developing in the market today denote further declines in prices for furnace coke. One involved a sizeable tonnage at $11.75, net, for the remainder of the year and $10.75 after that period until July 1. Sales at $12 to $12.50 for spot furnace also have been recorded. Foundry coke is about $1 higher than furnace.

Fair tonnages of sheets have been sold, one transaction involving 1000 tons of No. 10 blue annealed for export at 9.50c. Shipments of No. 28 galvanized sheets for Argentina brought 12.25c, Pittsburgh. Sales for domestic requirements are being made on a basis of from ½ cent to 2 cents a pound less than those for export.

Further Tightening

Of Export Embargo on Iron and Steel Announced by President

Washington, Aug. 28.—(by wire.)—Again acting under the urgent deficiencies law of June 15, President Wilson has issued another sweeping proclamation regulating all exports from the United States to all countries of the world. The new embargo has two sections, one for enemy countries and European neutrals adjoining Germany and the other for all other nations.

In both it is expressly forbidden to ship any iron or steel, raw, semifinished, or finished production, or any other metal or ore in addition to food, clothing, etc., except under special licenses. The new proclamation is effective Aug. 30 and is, of course, aimed at Germany.

Forty Ships

Are Ordered by Government of Merchant Shipbuilding Corp.

New York, Aug. 28.—Contracts have been signed by the Emergency Fleet Corp., whereby the Merchant Shipbuilding Corp. will construct 40 9000-ton fabricated steel freighters for the government. The latter company which was organized some time ago to take over the Chester Shipbuilding Co., Chester, Pa., also is building a new yard at Bristol, Pa., which is to have 12 ways and at this plant the 40 vessels involved in the new contract will be constructed.

The Emergency Fleet Corp. leases the Bristol yard, plant and facilities outright from the Merchant Shipbuilding Corp., under its terms, and employs the latter simply as its operating agent to build the ships for a fixed fee per ship. The steel for the shops, ways, etc., were supplied by the American Bridge Co., which also will supply the steel for the ships.

The Non-Ferrous Metals

Copper Lead Spelter Tin

New York, Aug. 28.—Apprenhension among consumers continues the dominating feature of the metal markets. The action of the government in fixing bituminous coal prices has not tended to encourage confidence among buyers. In none of the better known metals has trading aggregated a large volume in the past week.

Spelter prices have eased still further the past seven days, although fully 40 per cent of the smelting capacity is not operating, owing to the inability of producers to sell spelter with a profit at present prices. Evidences of manipulation are seen in the market to depress even present prices and it is alleged that producers who booked part of the recent government order for 11,500,000 pounds of Grade C at prices unofficially said to range from 8.55c to 8.95c, producers' plants, are making low offerings to "bear" the market and thus cover their contract at a profit. Prime western quotations follow: Prompt, 7.75c to 8.12½c; fourth quarter, nominally 8.12½c to 8.25c. Brass special is quoted about 8.75c.

Copper prices have declined ½c to ¾c the past week. There have been no indications as to what price would be fixed for electrolytic. Sales have been confined to small lots, excepting for some fair sized export orders. Electrolytic quotations follow: Spot, 26.50c, cash, New York; September, 25.75c to 26c; fourth quarter, 25c. Casting copper for nearby delivery is scarce and nominally quoted 26c to 26.50c; prime lake copper is nominally quoted 27c.

The leading lead producers are standing pat at their price of 11c, New York, for nearby delivery, but are making few sales, excepting to the government at the fixed price of 8c, in addition to shipments on sliding scale contracts. In the outside market, lead continues quoted about 11c, New York, for spot eastern delivery; 10.75c, St. Louis, for prompt shipment from the west; and 10.50c, St. Louis for September and October shipment. Little forward buying is being done, although a few October sales have been reported at the quoted prices.

The antimony market is slightly easier and extremely inactive. The government has bought some metal for delivery the first quarter of 1918, but details of these transactions have not been divulged. Quotations for Chinese and Japanese brands follow: Spot, 15c to 15.37½c; September and October, 15c to 15.25c.

Aluminum consumers are showing little interest in this metal. If anything the market has weakened a little in the past week. Quotations follow: No. 1 virgin, 47c to 49c; No. 1 remelted, 46c to 47c; No. 12 alloy, 37c to 39c.

Turning Out Pig Iron From Scrap

New Type of Electric Furnace Has Operated for Months on All-Scrap Mixtures, Making Low Phosphorus Pig, Washed Metal, Cast Iron, and Tool Steel

BY R. V. SAWHILL

A NEW type of electric furnace, which already has been employed in turning out cast iron, cast steel, low-phosphorus pig iron and washed metal, from all-scrap mixtures has been successfully operated at Watervliet, N. Y., for some time. The furnace is of the arc type, three electrodes being used. Modifications in the shape of the furnace which simplified the design and operation of the melting unit are felt by its designers to explain largely the results which the furnace has given in commercial operation. The furnace was developed not as a marketable product, but to meet the requirements of the Ludlum Steel Co., Watervliet, for a melting unit which would permit the manufacture of uniform tool steels in heavier tonnages of a quality equal to, or better than the high-grade crucible steel which the firm had been making since its organization in 1854. As a result of the experimental work, which was carried on under the supervision of Max Trembour, metallurgical engineer, in the Ludlum company, in 1912, began to use its new type of electric furnace exclusively for all melting operations. This decision was the more striking in view of the wide range of products which the Ludlum Steel Co. was manufacturing and which it has continued to produce. These products include high-speed steel, permanent magnet steel both chrome and tungsten, carbon tool steel, finishing steel, and ball and bearing steel. A measure of the success of the venture can be read in the rapid growth of the company during the past few years and in the fact that the original installation of small furnaces has been replaced by a battery of 10-ton units. Mr. Trembour, when he began his experiments some six or seven years ago, started to build a furnace around the electrodes, rather than adapting the arrangement of the electrodes to the shape of the furnace. His preliminary work was carried out on the assumption that the shape of the furnace was of primary importance in determining the efficiency of operation. As a result of his studies, he evolved an eliptical-shaped furnace with the three electrodes arranged in a straight line. This arrangement, according to the men associated with the operation of the furnace at the Ludlum plant, effectually prevents "cold" spots and gives a high degree of uniformity to the heat distribution. In substantiation, these operators point to observations which have shown that when the cold fringe around the bath becomes molten, all the center of the bath proves to have been thoroughly melted at the same time. The furnace in its present form was developed only as a result of thorough experimentation with a number of original types. These included a small single-phase type, a hexagon 3-phase type, and a 5-ton furnace of the circular rotating type. After the present shape of the furnace and the arrangement of the electrodes was decided upon, work was concentrated upon several small units and finally upon a 1500-pound unit providing satisfactory, three 5-ton furnaces of the same design were built and are still being used. To meet a growing demand, these furnaces were supplanted by the two 10-ton units. The smaller furnaces are now operated under lease by the Sweetser-Bainbridge Metal Alloy Corp., which has used them for manufacturing low-phosphorus pig iron and washed metal and for supplying the cast steel and cast iron used in its own plant and in that of the Ludlum Steel Co. The latter firm, from the first, has employed the furnaces

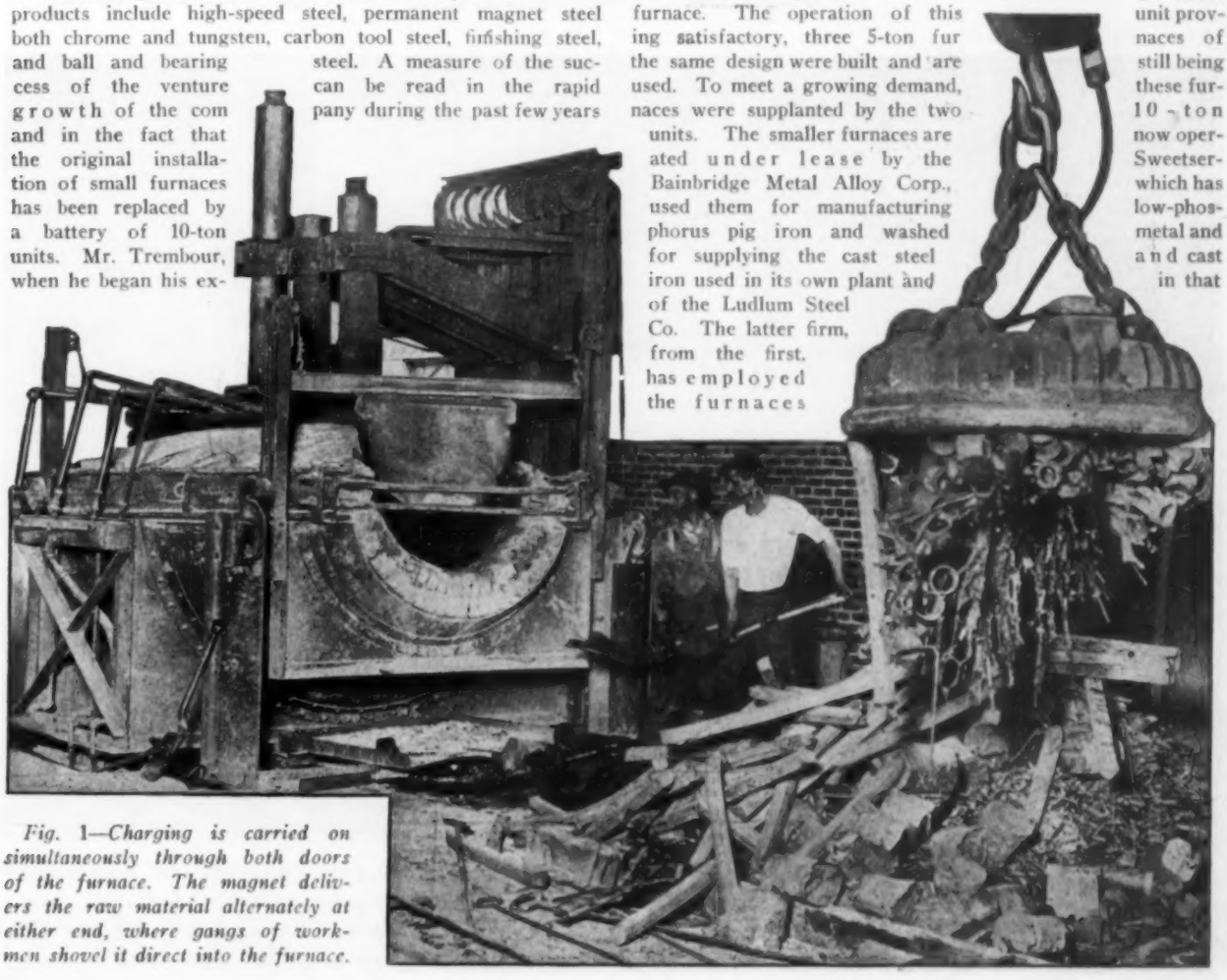


Fig. 1—Charging is carried on simultaneously through both doors of the furnace. The magnet delivers the raw material alternately at either end, where gangs of workmen shovel it direct into the furnace.

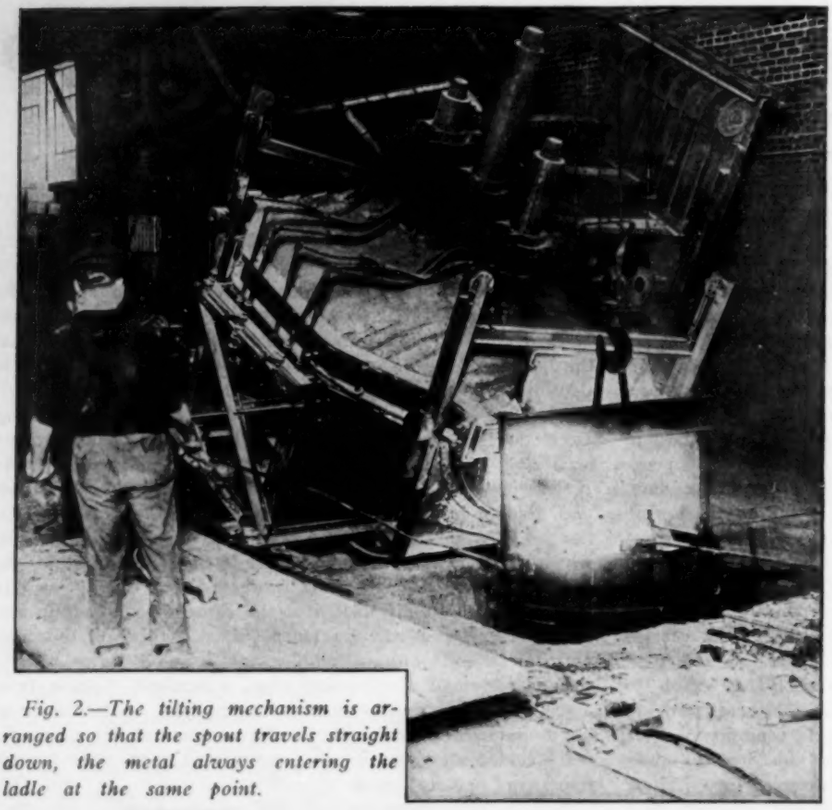


Fig. 2.—The tilting mechanism is arranged so that the spout travels straight down, the metal always entering the ladle at the same point.

only in making high-grade steels. A clear idea of the general arrangements and details of the furnace can be gained from an inspection of Figs. 6, 7 and 12. The furnace has no perpendicular walls and owing to its shape, any portion is readily accessible for repairing, or when operating, for removing the slag. Access to any part of the furnace is facilitated by the use of two doors, both of which are used when charging while one is employed for pouring.

Fig. 12, showing the arrangement of the busbars, transformers and cable connections, reveals clearly the method of introducing the current into the furnace. Electricity is purchased from the Adirondack Power Co. and enters the plant at 11,000 volts. It is reduced in a 1500-kilovolt-ampere transformer set, furnished by the General Electric Co., Schenectady, N. Y., to 90, 95 and 100 volts. It is then brought to the furnace through the busbar and flexible cable connections shown. The flexible cable is provided to compensate for the tilting of the furnace.

The position of the electrodes is controlled by hand wheels functioning through worm wheels and pulley, lead counterweights increasing the ease of

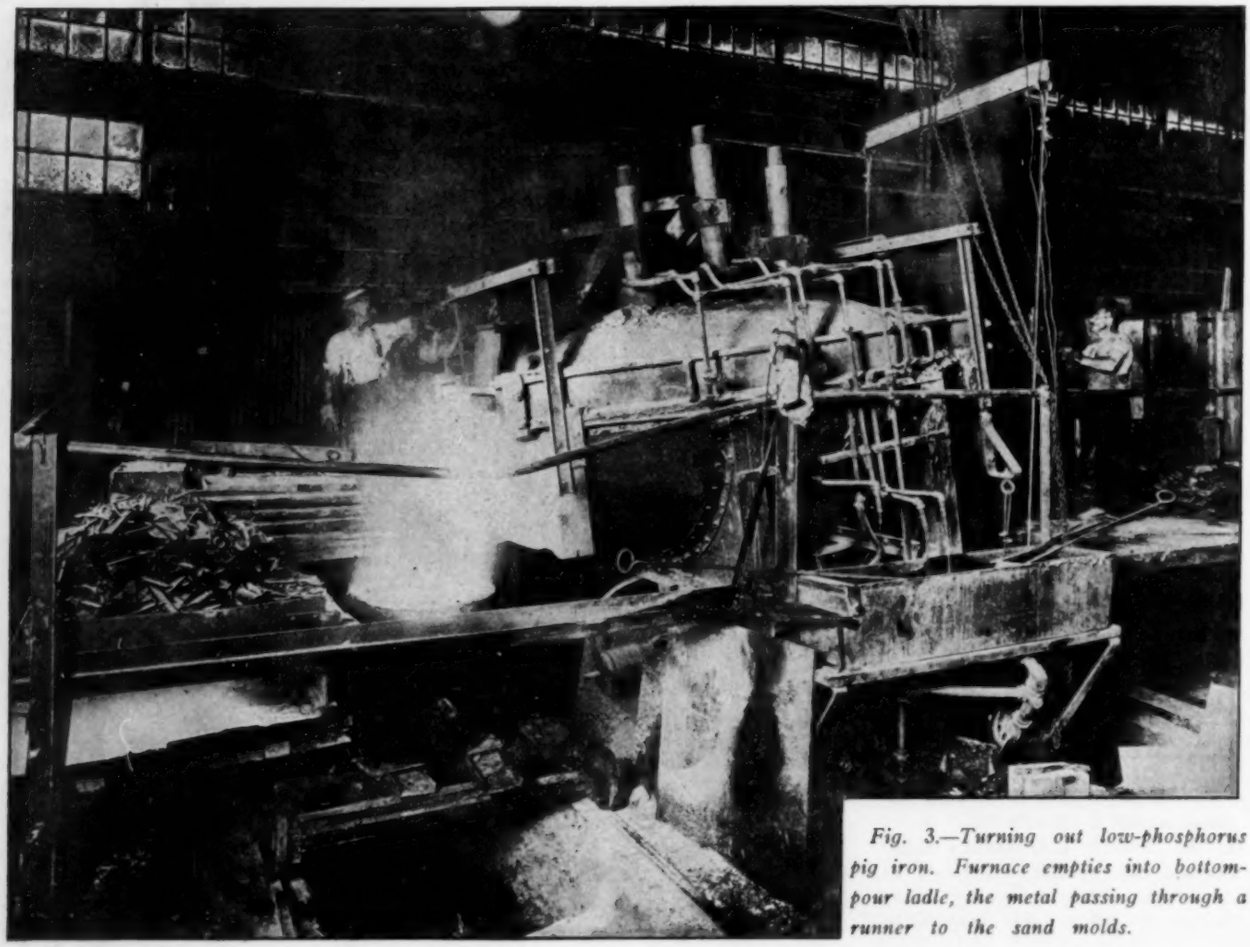


Fig. 3.—Turning out low-phosphorus pig iron. Furnace empties into bottom-pour ladle, the metal passing through a runner to the sand molds.

moving the wheels. Roller bearings and setscrews are employed to give greater flexibility in operating the electrode arms. The electrode holder is fastened to a rail which is raised and lowered by a cable passing over a wheel and through a pulley to the hand wheels. Plans have been prepared for installing automatic control, if desired.

The shell itself is 9/16-inch steel plate. The lining is comparatively thin. This, as the designer points out, is permitted owing to the uniform distribution of heat which is secured, with the consequent even wear upon all parts of the lining.

Rapid Relining

The problem of relining has been found to be a relatively simple one. With the 5-ton furnaces, a record of relining in 23 hours has been set. This time is computed from the minute when pouring was completed until recharging was started. The 10-ton furnace which was pouring when the writer visited the plant had been run for 92 heats and was still in good condition. Magnesite lining is employed, and this is reclaimed after being used, as ground magnesite is in demand at the Ludlum plant. The

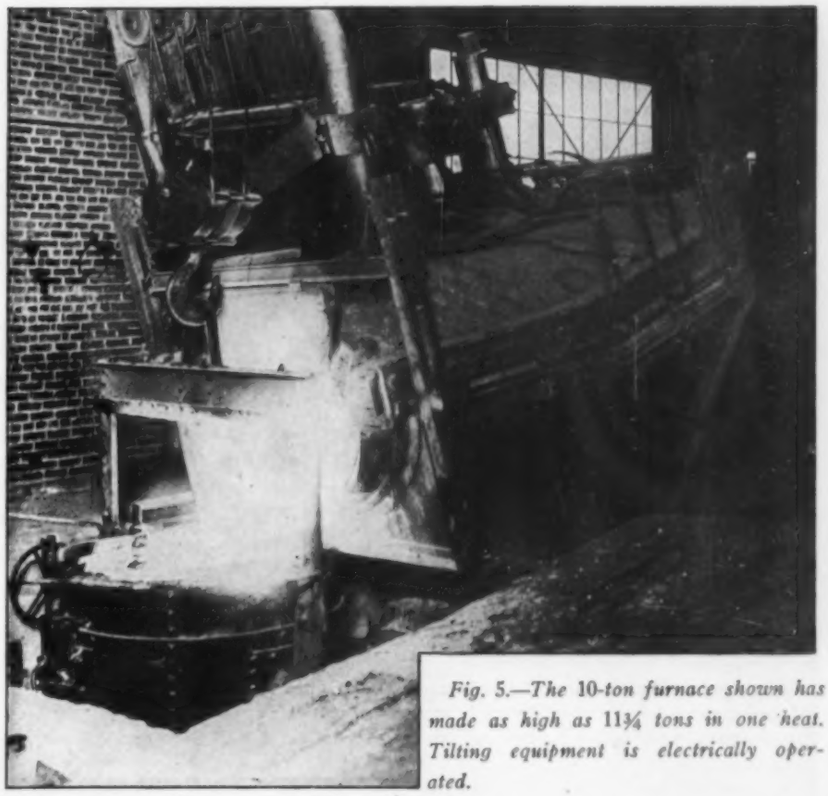


Fig. 5.—The 10-ton furnace shown has made as high as 11¾ tons in one heat. Tilting equipment is electrically operated.

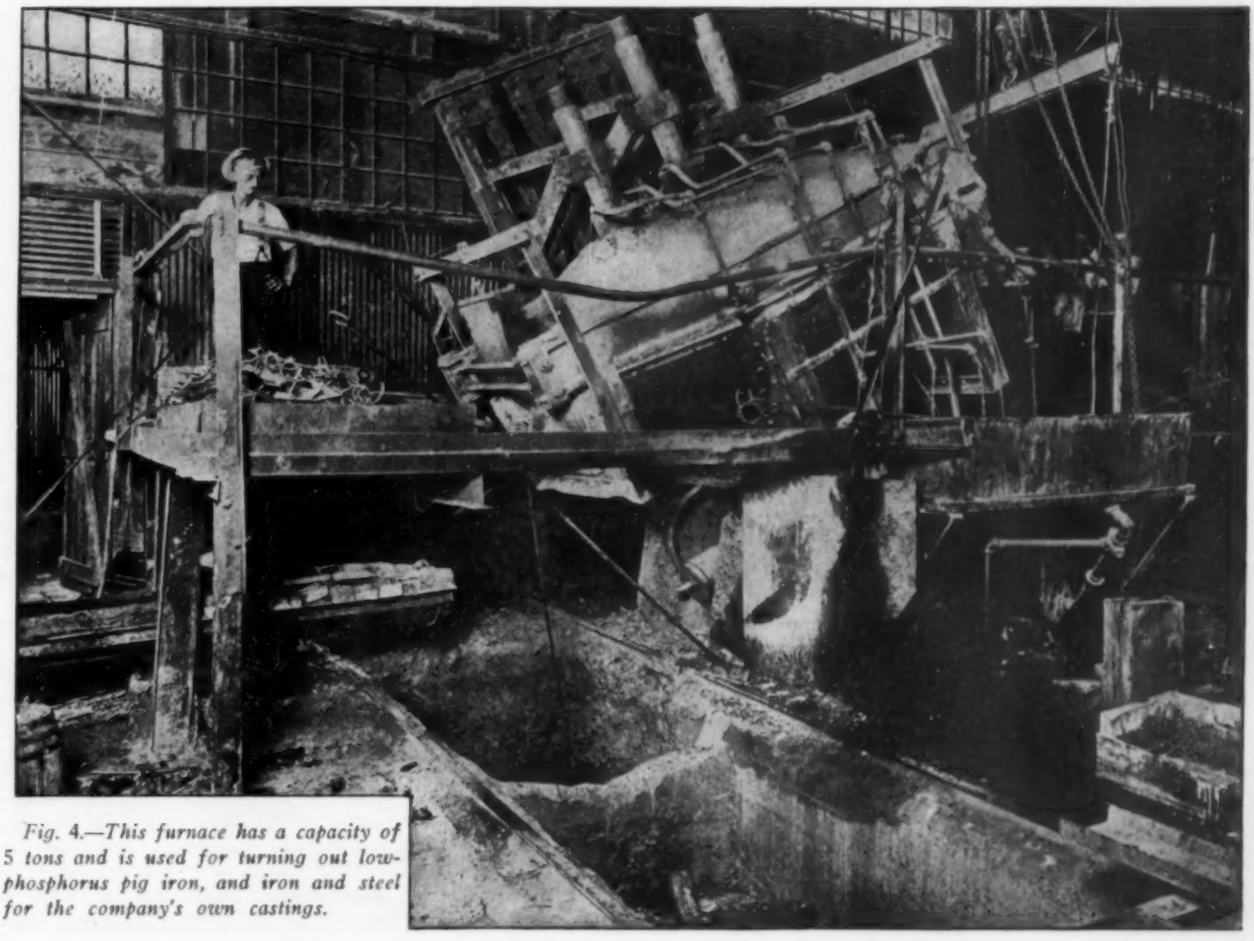


Fig. 4.—This furnace has a capacity of 5 tons and is used for turning out low-phosphorus pig iron, and iron and steel for the company's own castings.

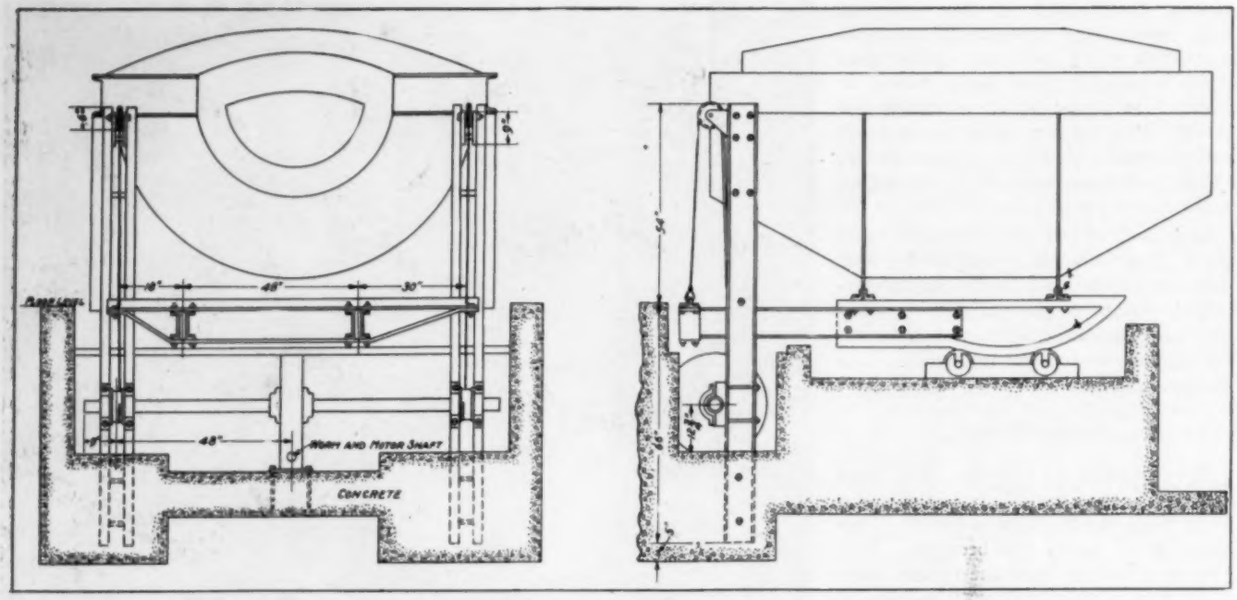


FIG. 6—DETAILS OF THE TILTING EQUIPMENT FOR 10-TON FURNACES

relining is usually done on Sunday and is undertaken when it is decided that the furnace will not run through the following week.

The construction of the roof is shown clearly in Fig. 13. The angle iron and independent rods take the thrust of the roof.

The irons and alloys used in the 10-ton refining furnace are stored in the concrete bins shown in Fig. 10. All material is handled from the incoming cars by magnet and sorted and stored according to grade. In making up the charge, the various grades are mixed in the proper proportions necessary to produce the quality of refined steel desired. The raw material is handled from the bins to the furnaces by the magnet which command both ends of each furnace. Hand charging is resorted to in actually stocking the furnace. The complete details of charging the furnaces are shown in Fig. 1.

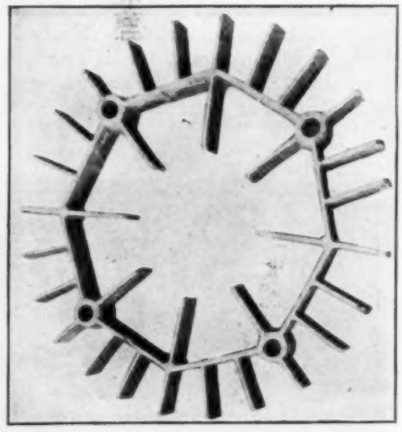


FIG. 8 — THIN-SECTIONED CASTING MADE FROM ALL-SCRAP MIXTURE

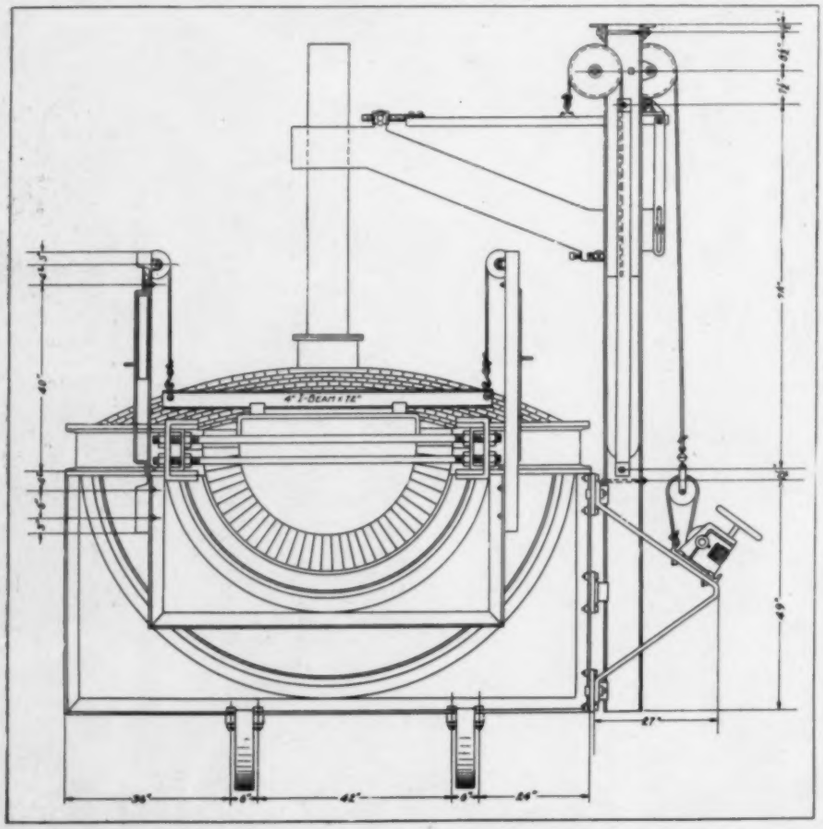


FIG. 7—FURNACE DETAILS, SHOWING ELECTRODE CONTROL

Charging, as pointed out previously, is facilitated by the provision for using both doors when shoveling the raw material into the furnace. The furnace is filled to the top, packing being simplified by the ease with which all parts of the furnace can be reached.

In pouring, each furnace is tilted on rollers actuated by individual motors located below the floor at one end of the furnace. The arrangement of the rollers, motor and tilting equipment is shown in Fig. 6. Through the arrangement of these rollers, the spout has only a downward movement, and does not move either forward or backward. This arrangement was designed to keep the position of the spout in a fixed vertical

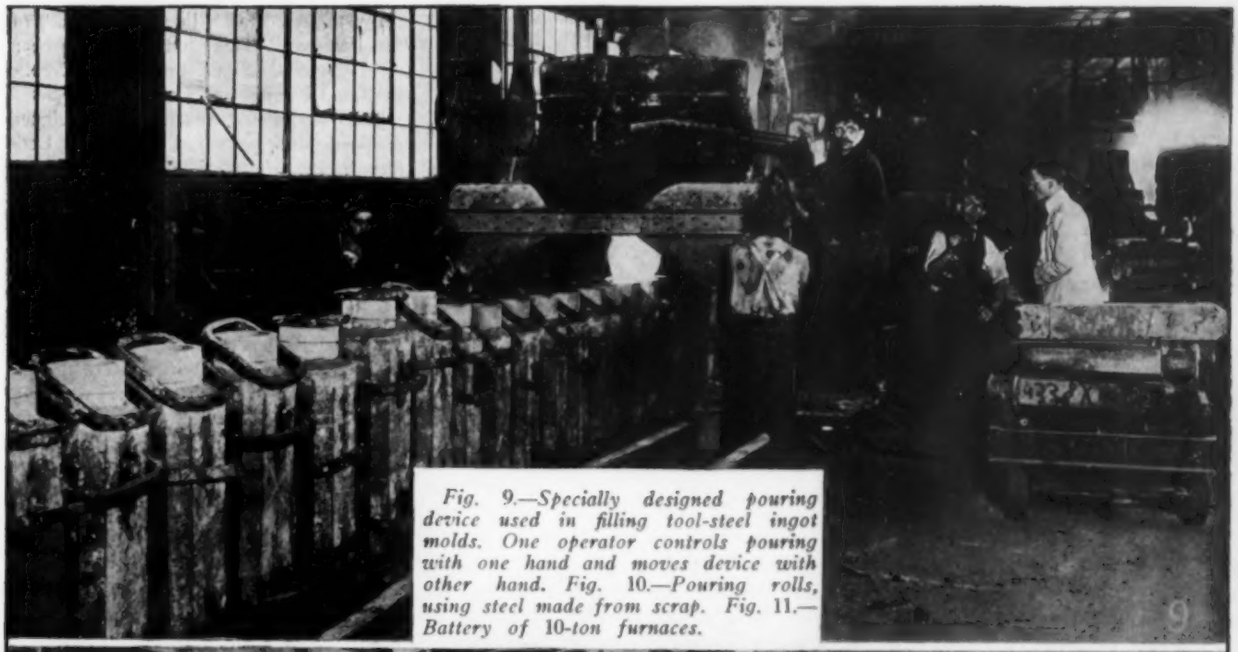
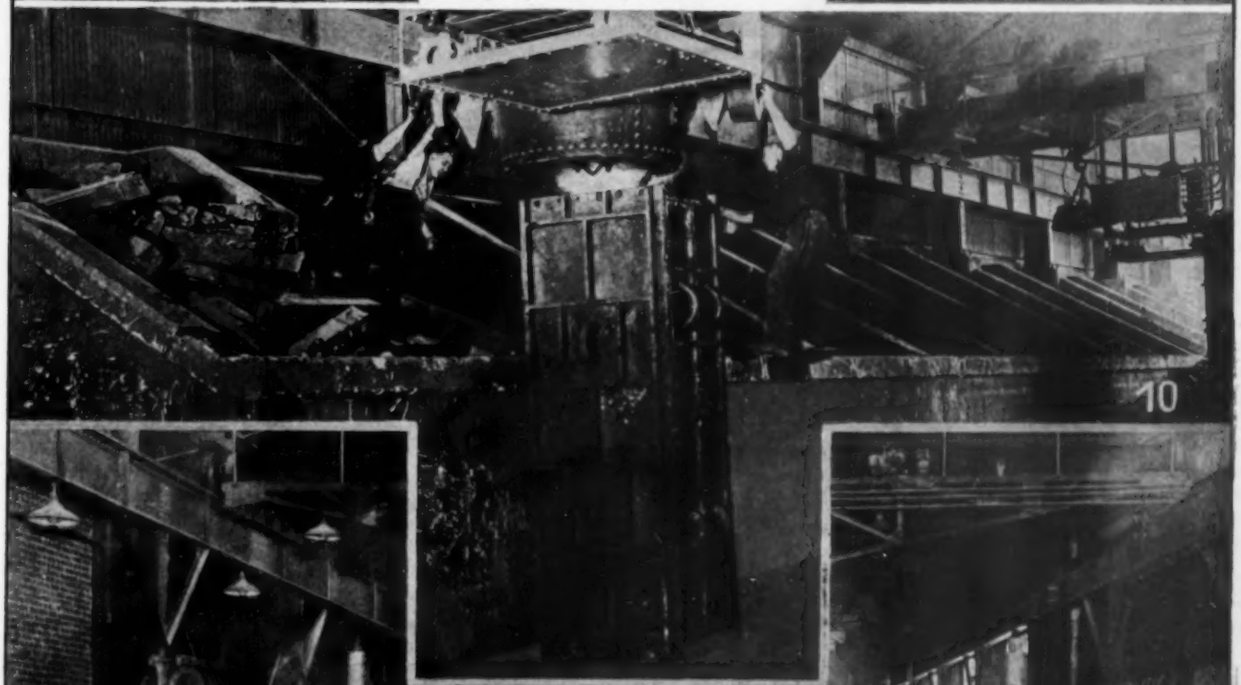
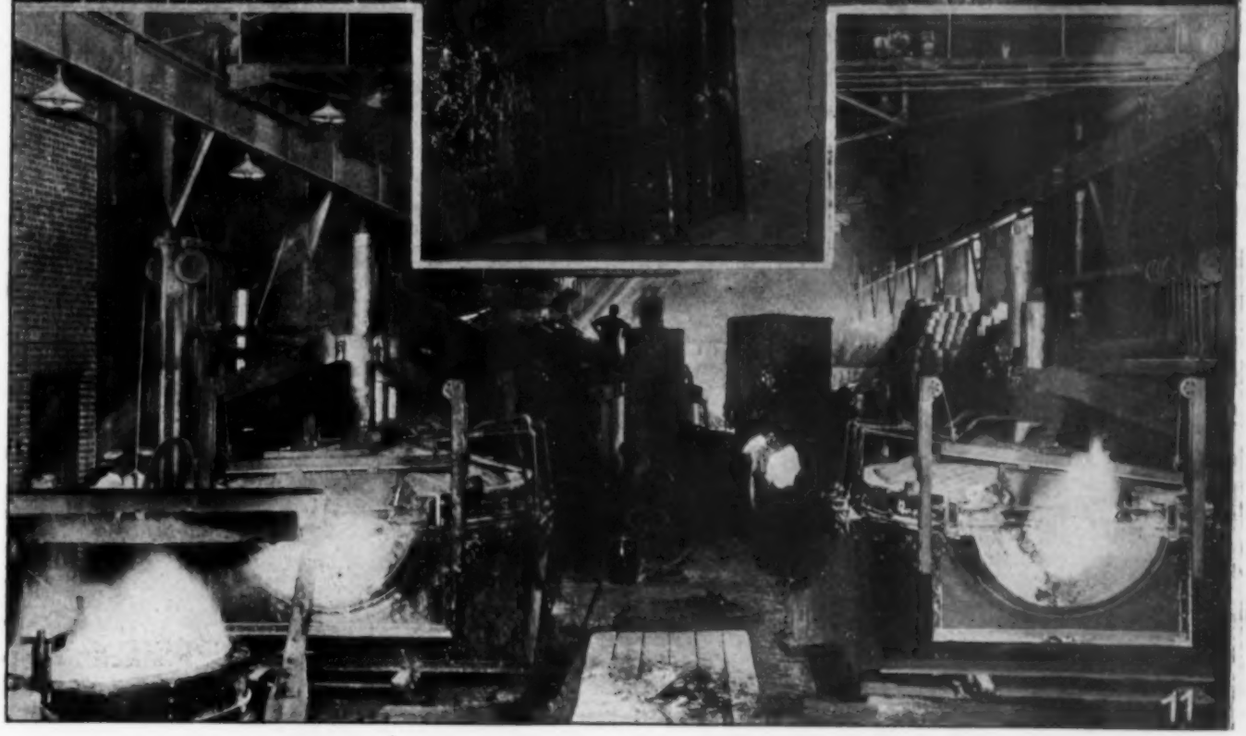


Fig. 9.—Specially designed pouring device used in filling tool-steel ingot molds. One operator controls pouring with one hand and moves device with other hand. Fig. 10.—Pouring rolls, using steel made from scrap. Fig. 11.—Battery of 10-ton furnaces.





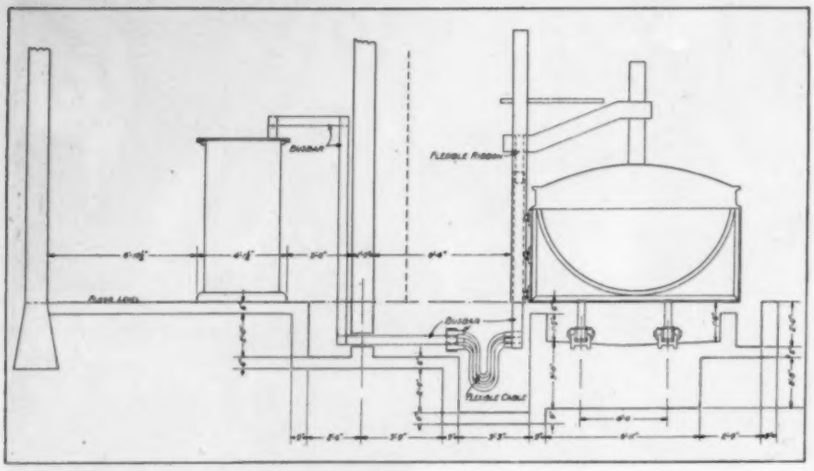


FIG. 12—ARRANGEMENT OF BUSBARS, TRANSFORMER AND CABLE CONNECTIONS

plane, thus giving an even stream of metal which would enter the ladle at the same point.

In the Ludlum steel plant, the receiving ladle is lifted by a crane from the pit in front of the furnace and placed in a pouring device developed by Max Trembour and Thornton W. Price, consulting engineers, New York City. Through a specially designed casting, the ladle is automatically brought into position directly over the ingot molds. The device runs on its own tracks, one operator controlling its forward movement with one hand wheel and opening and shutting the pouring spout with the other hand by means of a lever. A more complete description of this unique pouring ladle, including several illustrations, is given on page 450. The ingot molds ready to receive the metal as well as the pouring device in operation are shown in Fig. 9.

In the foundry operated by the Sweetser-Bainbridge Metal Alloy Corp., where two 2-ton furnaces are in service, the metal when being poured enters a bottom-pour ladle, passing through a runner into the ordinary sand molds. The complete pouring arrangement in the foundry is shown in Fig. 3.

The principal product of the Sweetser-Bainbridge furnaces for some time has been low-phosphorus pig iron, although the furnaces have been used to turn out washed metal and also gray iron and steel for use in making the company's own castings. Iron and steel scrap only are used, no pig iron being employed in the charge. Through the use of deoxidizers and ferroalloys, and the close supervision of the components of the charge, it has been found possible to produce the various grades of iron and steel specified.

One man is employed to operate each furnace, with one melter watching several furnaces. The operators at both the Ludlum plant and the Sweetser-Bainbridge plant are men who were trained to their work quickly and who serve under a trained supervisor.

Several weeks ago, a number of men familiar with the results attained with these melting units, formed a company to build and license the use of the furnace. This company has been incorporated under the name of the Ludlum Electric Furnace Corp.

The Ludlum furnace was designed primarily for making steel for the Ludlum company's own requirements. It represents a number of years of experimental effort. The conversion loss when melting metal for steel castings is said to be less than 5 per cent. The 5-ton furnace is so designed that it can turn out six tons in a single heat and the new 10-ton furnace now being developed will melt 12 tons at one time. The Ludlum Steel Co. has used its furnaces not only for melting steel, but also for casting iron roll wobblers.

In general foundry work it is pointed out that this furnace enables the melter to turn out a metal of any desired carbon content starting from ordinary steel scrap. Although the cost of melting cast iron in the electric furnace undoubtedly is higher than in the cupola, it is claimed this is more than offset by the difference in the price of the raw material which the electric furnace makes it possible to use.

For commercial purposes, the Ludlum furnaces are being built in four different sizes—1½, 3, 5 and 10-ton.

The officers of the Ludlum Electric Furnace Corp. are: H. G. Batcheller, president; Edwin Corning, treasurer. Thornton W. Price, consulting engineer, New York City, is vice president. The general offices are in the Woolworth building, New York.

Refining Scrap

In United States patent No. 1215065, Feb. 6, 1917, Edward H. Schwartz of Chicago, patents a process of producing high-grade material from scrap by melting with carbon-steel scrap a proper proportion of silico-spiegel or manganese steel scrap, with or without the addition of pig iron of suitable silicon content. Preliminary

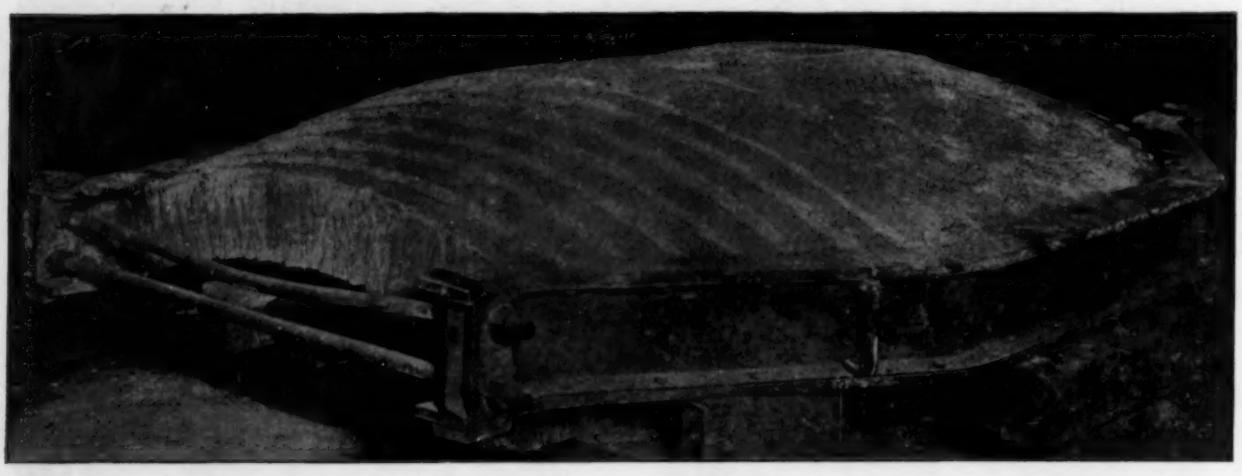


FIG. 13—SPARE FURNACE ROOF, SHOWING CONSTRUCTION DETAILS

smelting may be carried out in a cupola on a bed of coke or coal and then the molten product transferred to an electric, open-hearth or reverberatory furnace or a converter. In treating carbon steel for final electric furnace treatment about 95 per cent steel scrap and 5 per cent spiegeleisen are used in the cupola charge. In making manganese steel a mixture of 30 per cent manganese-steel scrap, 50 per cent carbon-steel scrap and 20 per cent high-silicon pig iron is used when converter treatment is to follow cupola melting. The process may also be used for the manufacture of semisteel, gray iron and white iron, using in each case quite large percentages of scrap. The high grade of product obtained is stated to be due to the deoxidizing and refining action of the manganese. The spiegel scrap also exerts a desulphurizing action on the carbon steel scrap when melting in the cupola, and by using limestone as flux more or less phosphorus is eliminated.

Facts About Ordnance Castings

YOUR editorial on page 61 of THE IRON TRADE REVIEW of July 12, entitled "Castings or Red Tape", has just come to my notice. I feel impelled in justice to the army which is now rendering the nation a great service, and to that part of the public which desires to know the truth, to make a categorical denial of each and every contention your article contains, at least, in so far as your charges can be made to apply to the Watertown arsenal.

Referring at first to your statement that on a recent opening of bids, only one proposal had been submitted, and to your explanation of the reason, viz., that this was "due entirely to commercially impossible conditions which the government insists upon", I propose to show that these conditions are not impossible, either commercially, chemically or physically.

You described these "impossible conditions" as consisting of "specifications for converter steel castings containing sulphur requirements which are impossible of attainment at present, due to irregularities in the coke supply".

Let us see what these "impossible conditions" were. By referring to instructions to bidders, No. 434, containing specifications which govern the manufacture and inspection of "gun carriages, artillery vehicles and similar ordnance material", issued by the war department, under date of March 15, 1917, and signed by William Crozier, brigadier general, chief of ordnance, you will find on page 19 a paragraph which has to do with this "impossible" sulphur requirement, which reads as follows:

"Unless otherwise specially authorized by the chief of ordnance, all steel castings and steel forgings classified below in this and the following article shall be made by the open hearth, electric, crucible, or tropenas process, and must not contain more than five hundredths of 1 per cent of phosphorus, nor more than seven hundredths of 1 per cent of sulphur."

Therefore, it is your contention that a limit to the sulphur content of 0.07 per cent is "impossible of attainment at present".

If justification for this specification issued by the chief of ordnance were necessary, a condition that I do not believe to exist in the minds of most producers of steel at the present time, it would only be necessary to refer to the standard specifications of the American Society for Testing Materials, which place the top limit of sulphur content at 0.05 per cent; to the United States navy specifications for steel castings, which place the top limit at 0.06 per cent; to the specifications of the American Railway Master Mechanics Association for locomotive castings, which place the sulphur limit at 0.06 per cent; and to the specifications of most other well-known buyers of steel castings the country over with sulphur limited to 0.06 per cent. Yet 0.07 per cent you refer to as "impossible of attainment at present".

Editor's Note

The accompanying communication was submitted by R. B. Farquhar Jr., superintendent of foundry, Watertown Arsenal, Watertown, Mass., and The Iron Trade Review gladly gives it space, although the demands on our columns preclude its being presented in its entirety. Mr. Farquhar's communication is presented, however, without prejudice to our original editorial which was founded on facts that are believed to be beyond question.

As a proof that this specification limiting sulphur to 0.07 per cent in converter castings can be met, I have before me copies of purchase orders placed within the past three or four months with 18 different steel foundries, one-half of which are using converter steel, and in no case has this specification, No. 434, issued by the chief of ordnance, under date of March 15, 1917, been waived as to sulphur content. These foundries have all taken these orders, have met, and are meeting this requirement, their castings being accepted.

If further proof is necessary, your attention is called to the fact that this arsenal is producing many tons of steel castings per month to meet ordnance department specifications No. 434 in every respect. The sulphur in the castings produced here at the present time from the converter which we operate in conjunction with an open-hearth furnace, is usually kept below 0.055 per cent, the sulphur on a few heats recently running in sequence as follows: 0.046, 0.040, 0.053, 0.051, 0.040, 0.049, 0.052, 0.043, 0.041, 0.040, 0.052 per cent.

There is no secret or mystery surrounding the production of steel castings from the converter, with such sulphurs as the above, the principles underlying this accomplishment being well known to all steel foundrymen who operate bessemer or tropenas converters. The explanation may be expressed in a very few words: It is accomplished by the use of low-phosphorus pig iron with steel scrap and high-grade coke. By high-grade coke, I mean coke with sulphur below 1 per cent and ash below 10 per cent.

As to your statement, "foundrymen recently have had to use coke containing as much as 23 per cent ash and 2.25 per cent sulphur", I am glad to agree with you that the majority of the steel foundrymen of the country are not "lacking in patriotism at a time of great national stress", however, I also believe that they are well able to pay for high quality of coke, judging by the prices that some foundrymen have quoted recently on steel castings for the United States army.

As further proof that such coke can be obtained, I have personally seen the chemical analyses of many carloads of coke, amounting to hundreds of tons, during the past year that were received at the works of the Midvale Steel Co. and at this arsenal, which coke met with the above requirement of sulphur below 1 per cent and ash below 10 per cent. Shipments of coke received at this arsenal during the past two months have averaged about as follows:

Sulphur, per cent	Ash, per cent
0.520	7.75
0.55	5.82
0.695	6.22
0.687	7.32

Referring to the third paragraph of you editorial, you state, "at a time when the government needs castings as it never needed them before, nothing is being accomplished, and no one can be found who has the nerve to cut the

maze of red tape surrounding every order". I can readily imagine how emphatic would be the denial of the 18 foundries throughout the country, who are at the present time filling orders for castings for this arsenal, to the first part of your statement, "that nothing is being accomplished". As explained above the "red tape" of insisting upon sulphur below 0.07 per cent can only be cut by Brigadier General Crozier.

You do not refer to the physical properties of the steel castings being produced for the United States army, although the specifications in this respect are difficult to meet, and very properly and necessarily so on account of the severe shocks to which ordnance castings are subjected. The physical requirements of the most difficult castings for this arsenal are described as cast steel No. 3 in specifications No. 434, as follows:

Tensile strength, pounds	85,000
Elastic limit, pounds	45,000
Elongation, per cent	12
Contraction of area, per cent	18

I suspect your "one foundryman interested in the matter, who took the question up with highest authorities in Washington", had difficulty in convincing himself that his steel would meet this requirement, and it certainly would not have done so even though he used the high-grade coke referred to, unless it was given a careful, intelligent and up-to-date heat treatment, matters about which many steel foundries are, unfortunately backward. These specifications cannot be met consistently day after day with practically every heat, if castings are given a "lick and a promise", for heat treatment and foundries where such methods prevail had better leave government work alone.

Welding Reclaims Worn Mill Equipment

THE use of thermit welding to repair the worn pods on the ends of a large roughing-mill pinion in the steel plant of the Universal Rolling Mill Co., Bridgeville, Pa., resulted in a saving in the cost of maintenance and prevented considerable loss of time which would have occurred, had it been necessary to replace the roll with a new one. Incidentally, a further saving was effected in thus reclaiming the worn pinion for further service.

The roughing-mill pinion was of the herring-bone type. It was used in a slab mill. The diameter of the gear was 28 inches; the roll neck was 16 inches in diameter and the width of the neck, not including the pods, was 19 inches. The four pods at the ends of the pinion were worn away by the constant grind of the coupling boxes. The outer ends were worn from a curved rectangular shape to a pointed triangular shape.

In order to properly build up a mold, one end of the pinion was lowered into a pit and steadied in this position by filling the pit with sand as shown in Fig. 2. For the base of the mold box, a square steel plate about 5 x 5 feet with a circular opening in the middle was fitted around the neck. The plate was lowered until it rested on the circular collar formed by the junction of the pinion and the neck. For the wall of the mold, a cylindrical ring of an old smokestack about 3 feet in diameter and with four holes 90 degrees apart at the proper places for preheating purposes was used. Bricks were lined around the bottom of the mold box to prevent the sand from escaping when the mold was being rammed.

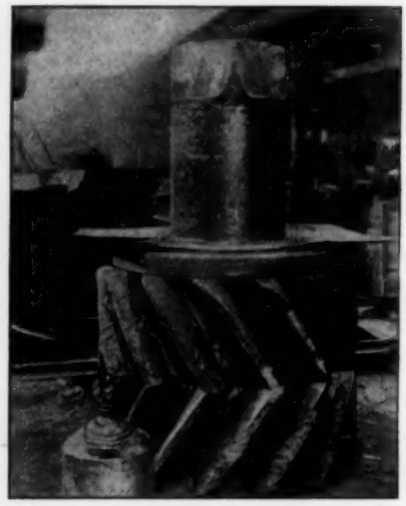


FIG. 2—HOW PINION WAS STEADIED IN SAND PIT

About 330 pounds of welding alloy were used for the crucible reaction. After tapping the thermit into the mold, the pinion was left to cool over night. Fourteen hours later, the accessories were removed from the neck of the roll and the process was repeated on the reverse end. The complete operation of welding both necks required four days' time, including some night work. The building up of the pods was accomplished by one operator and three helpers. The completed pods ready for machining are shown in Fig. 1.

Another interesting application of thermit welding in repairing steel mill equipment is shown in Fig. 3 which indicates how cinder ladle frames at the plant of the La Belle Iron Works, Steubenville, O., are saved from the scrap heap. The frame shown in Fig. 3 was broken in two places as indicated by the arrows. After building up a mold box around the parts to be welded, the casting was preheated and the thermit was tapped into the mold. In this particular case, owing to the nature of the work, it was unnecessary to machine the welded portion.

FIG. 1—COMPLETED PODS ON REPAIRED PINION READY FOR MACHINING

FIG. 3—CINDER LADLE FRAME RECLAIMED FROM SCRAP HEAP BY WELDING

Properties of Refractory Materials

The Author Classifies and Describes Four Types of Refractories and Then Discusses Their Properties and Adaption to the Different Requirements of Various Metallurgical Operations

BY A. V. BLEININGER

REFRACTORY materials are indispensable in the practice of the metallurgical arts, in the melting of glass, the clinkering of cement, in the ceramic firing process, and last but not least in the generation of steam. According to the temperatures required and the particular conditions of each kind of use, a considerable number of materials is available. The principal types are the clay, silica, magnesite and aluminous refractories. In addition, special refractory materials find more restricted application, such as the carbon materials, carborundum, zirconium oxide and others.

For the sake of convenience three kinds of clay materials may be recognized in this connection, called for convenience, No. 1, No. 2 and No. 3 refractories. The greatest heat resistance is shown by those clays corresponding most closely to the theoretical kaolinite composition, 46.3 per cent silica, 39.8 per cent alumina and 13.9 per cent chemical water, which upon heating becomes 53.8 per cent silica and 46.2 per cent alumina, and by the so-called bauxitic clays. The latter are admixed with some bauxite which may raise the alumina content as high as 60 per cent (in the hydrous state). The increased amount of alumina brings about a decided increase in the refractoriness of the material. Clay of the purest type possible, kaolinite, has a softening temperature corresponding to the melting point of platinum, 1,755 degrees Cent., or expressed in standard pyrometric cones, to cone No. 35. Owing to the greater or smaller amount of impurities such as silica in the form of quartz, feldspar, lime and magnesia, this softening temperature is hardly ever realized. A softening temperature of 1,725 degrees Cent. is about as high as is reached by high class fire clays, such as the flint clays. Clays containing bauxite may soften at temperatures as high as 1,800 degrees Cent. A high grade or No. 1 fire clay should not soften below cone No. 31 or approximately 1,685 degrees Cent. This point, therefore, would be about the dividing line between No. 1 and No. 2 fire clays, though others place the limit considerably lower. The division line between the No. 2 and the No. 3 clay refractories would be at cone 28 or roughly 1,635 degrees Cent. Clays softening below this limit might be classed as No. 3 refractories. Although this arbitrary classification may be considered too exacting by some, it has worked out quite satisfactorily in a clay testing practice extending over a number of years.

Fire clays may also be divided into two types of clays according to whether they are plastic and dense burning at comparatively low temperatures, say, around 1,200 degrees Cent., or whether they are open burning, that is, retain their porosity within this temperature region. The clays of the second class are also, as a rule, less plastic than those of the first. The characteristic behavior of the denser burning clays is due, of course, to their higher content of fluxes.

Characteristics of Clays

In the temperature-porosity diagram, Fig. 1, clay *"a"* is of the open burning variety, while the remainder are of the dense burning class. It happens that this diagram represents five well known European fire clays, of which several have been imported to this country in considerable quantities. In this series clay *"a"* is the famous glass pot clay from Gross Almerode, Germany, clay *"b"*, a very plastic crucible clay from Klingenberg, Germany; clay *"c"*, a glass pot clay from Kaschkau-Mehren, Germany; clay *"d"*, an excellent glass pot clay from St. Loupe, France, and clay *"e"*, a plastic fire clay from Breitscheid, Germany.

Siliceous fire clays, that is clays with a silica content above 75 per cent, possess a lower softening temperature than the highest grade fire clays and are influenced more potently by the presence of fluxes. It is more important that a siliceous fire clay be low in the basic constituents, iron oxide, lime, magnesia, potash and soda than an aluminous one since the lowering of the softening point is more marked. On the other hand, siliceous clays have a decided advantage over the average clay fire brick in that they are not subject to shrinkage in use and are able to carry considerable loads at furnace temperatures without showing any appreciable deformation. They are able to stand up well at temperatures not far removed from their ultimate softening point, while clay fire brick cannot be safely carried to temperatures within 100 degrees Cent. below the deformation point. At the same time, clay fire bricks show considerable contraction and soften sufficiently even at temperature as low as 1400 to 1450 degrees Cent. to render them unable to carry loads greater than 10 pounds per square inch. This statement needs to be modified, however, in that high clay fire bricks may be manufactured by the use of highly calcined No. 1 clay (grog) and by high burning of the material so that the contraction is very small and the load carrying power quite high. In doing this, the contraction of part of the clay is practically completed in the calcination and in the burning of the bricks so that but a small shrinkage can take place later. At the same time the compact structure is able to resist the usual pressure conditions in furnaces satisfactorily. Such a process of manufacture is expensive. All non-siliceous clays tend to shrink in burning, due in part to the colloidal contraction and in part to the effect of the fluxes which are active in lowering the viscosity of the clay, thus bringing about a gradual liquefaction. In siliceous clays this shrinkage is practically eliminated not only on account of the much smaller amount of clay substance present, but also on account of the volume increase of the quartz in its transformation to cristobalite and tridymite. This volume change may be great enough to cause expansion of the brick upon burning rather than contraction. The high silica content, however, brings with it certain disadvantages such as inability to withstand sudden temperature changes which does not apply to clay bricks.

In the manufacture of clay fire bricks two kinds of materials are to be recognized, those made from one, more or less homogeneous clay and those produced from a mixture consisting of a large part of a very refractory hard clay, deficient in plas-

The author, A. V. Bleininger, is ceramic chemist, U. S. bureau of standards, Pittsburgh. This paper was presented before the Engineers' Society of Western Pennsylvania.

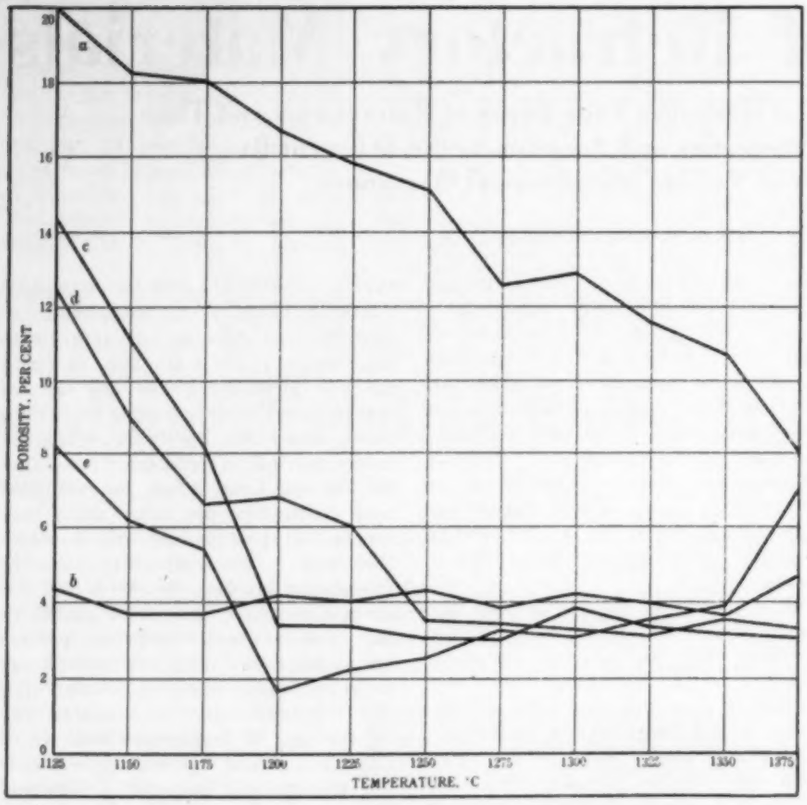


FIG. 1—DIAGRAM SHOWING BEHAVIOR OF ONE OPEN AND FOUR DENSE BURNING CLAYS

ticity, bonded together by a less refractory but very plastic one which makes possible the molding of the tempered mass. The second case applies to the Pennsylvania fire bricks, in which the ground flint clay is cemented together by a plastic material. It is to be regretted that occasionally the plastic clay is so deficient in refractoriness that it seriously lowers the quality of the product, thus spoiling the effect of the high grade flint clay.

Importance of Hard Burning

The value of the hard burning of fire bricks needs also be emphasized. There is no doubt but that clay refractories fired to as high a temperature as possible are greatly to be preferred to underburned material, no matter how this may affect the looks of the product. Those who prefer soft burned bricks usually can give no adequate reason for their position.

Silica refractories are principally produced from a mixture of ground quartzite and lime paste so that in the fired product the silica content may be from 94 to 97 per cent, and that of the lime about 2 per cent. The firing of the dried bricks is carried to quite a high temperature, usually to above 1,500 degrees Cent. In the burning, the lime bond develops to form a mono-calcium silicate and the quartz is transformed to cristobalite, an intermediate crystalline modification of silica. It has been shown by Kenneth Seaver that in industrial practice the transformation of the quartz to cristobalite is practically as complete as is possible. This transformation is coincident with the expasion of the brick, usually ⅜-inch to 7/16-inch per linear foot over the mold measurements.

The use of bauxite and mixtures of bauxite and fire clay is assuming larger proportions than it has in the past. This is particularly true at the present time when due to the scarcity of magnesite, a substitute for the latter is being sought. From accounts which have been obtained is seems that it is possible to use refractories of this type successfully for purposes where magnesite seemed indispensable. The hydrous bauxite ores usually are impure, containing, as a rule, 5 to 6 or more per cent of ferric oxide. This applies to most American bauxites. The melting point of pure alumina is about 2,049 degrees Cent., but that of bauxite does not, as a rule, exceed 1,820 degrees Cent. A very high shrinkage upon heating is characteristic of bauxites and hence it is important that as large a part of the material as possible be previously calcined. Unless this is done and the calcination carried to a high temperature the shrinkage of the product in use will be so high as to render it very unsatisfactory. Bauxite tends to contract also under pressure at furnace temperatures and hence is not so well adapted for uses where severe load conditions prevail. Owing to the feebly plastic nature of bauxite, bricks consisting of calcined and raw bauxite are rarely made. Usually a good fire clay is employed to bond together the calcined bauxite. This naturally reduces the refractoriness of the mixture so that bauxite-clay fire bricks do not, as a rule, possess a softening temperature above 1,800 degrees Cent. Bricks of this type are sold on the basis of the alumina content.

Greater refractoriness can, of course, be reached by the use of refined bauxite from which a large part of the iron oxide has been eliminated by chemical treatment.

Alumina is also an important constituent of refractory porcelain such as is used for pyrometer tubes, the so-called Marquardt porcelain. Here a considerable amount of alumina, previously calcined together with some feldspar is introduced as the non-plastic portion of the mixture which in addition contains more feldspar and plastic kaolin. The fact might be mentioned that Marquardt porcelain of excellent quality has been produced by the Pittsburgh laboratory of the bureau of standards, covered both with a bright and a matt glaze.

Magnesia Refractories

The magnesite products represent typical basic refractories. Two kinds of magnesite are to be distinguished, rocks approaching pure magnesite in composition such as the Grecian and California materials and the impure ones, containing from 3 to 8 per cent ferric oxide and more or less silica, of which the Austrian magnesite is characteristic. The melting point of pure magnesia is very high, about 2,800 degrees Cent., but that of magnesite brick rarely exceeds 2,170 degrees Cent. Owing to the extreme heat resistance of the material and its great shrinkage, about 50 per cent, by volume, pure magnesite is not suitable for refractory purposes since it would be exceedingly difficult to reduce it to practically constant volume, while owing to the fluxing action of the ferric oxide in the impure material the latter is more easily compacted.

The calcination of the magnesite is very important and in Europe it is conducted in shaft kilns working with forced draft. Rotary kilns would be well suited for this purpose. The dead burned magnesite, after having been crushed is then intimately mixed with

some low burned magnesite, moistened with water and shaped into bricks under considerable pressure. The soft burned magnesite functions as the cementing material. The bricks are then dried and burned in kilns to a high temperature. Magnesite bricks, owing to their basic nature and high heat resisting quality form a valuable refractory. Magnesite is subject to certain limitations however in use, such as its tendency to spall when subjected to sudden temperature changes and its friable character under conditions of abrasion. The shortage of magnesite due to the European war conditions has made it necessary to look about for substitutes. In many cases bauxite materials have been found very satisfactory indeed and it has been reported from several sources that this material has been permanently adopted. Dolomite has also been used as a substitute. For this purpose impure dolomite can only be used as it is necessary to "dead burn" the material as much as possible before attempting to make it either into bricks or to tamp furnace bottoms with it. A fairly high content of iron oxide is to be preferred as in the case of magnesite and the calcination temperature should be carried as high as possible. Attempts have been made also to coat the crushed dolomite with a pulverized slag suspension in water so that upon burning a protective coating would be formed on the surface. Unfortunately in several such cases the slag was decidedly basic and hence did not enter into intimate combination with the dolomite. A more acid slag would certainly be preferable for this purpose. The calcined dolomite, crushed to the desired fineness is then mixed with hot tar as soon as possible and molded into bricks. These then must be burned again in order to remove the tar and bring about some consolidation of the particles. For tamping the tar likewise is used as the bonding material. Dolomite materials of this sort are invariably apt to slake upon standing in the air. In spite of this difficulty it has been used to a considerable extent in European practice for many years.

Carbon Refractories

Probably the best known application of carbon for refractory purposes is in graphite crucibles, nozzles, etc. In these from 40 to 60 per cent of graphite is introduced. A small amount of calcined clay (grog) is also used and the whole bonded together by means of a very plastic fire clay. The graphite comes from Ceylon and the bond clay generally employed for this purpose has been the Klingenberg clay, imported from Germany previous to the war. Difficulty is being experienced at the present time in securing the graphite and the importation of German clay is, of course, completely cut off. The supply of domestic graphite appears to be inadequate and its quality is said to be inferior to that from Ceylon. A shortage in graphite would make it necessary to resort to the use of artificial graphite, carborundum, gas carbon, electrode carbon or even ground coke. Coke bricks and similar refractories have been used in Europe for many years and the use of this material might be extended to crucibles even though their life would be considerably shorter than that of the graphite products.

The elimination of the German bond clay is not a really serious matter, as it is quite possible to obtain similar results, not by the use of any single American clay, but by a mixture of two plastic fire clays, one of which is of the dense, the other of the open burning variety. By correct proportioning, the requirements of both brass and the steel melting should be satisfied. Such clays can be found among the so-called ball clays of Kentucky and Tennessee and the plastic fire clays of Pennsylvania, Missouri and Ohio.

For certain purposes carborundum-clay mixtures have been used but apparently with only indifferent success.

Among the rarer and more costly refractories chromite is to be mentioned, employed as a neutral parting between acid and basic refractories. The melting point of the chrome product has been found by Kanolt to be near 2,180 degrees Cent.

Pure Magnesia Used Sparingly

Pure magnesia fused in the electric furnace is sometimes used as a refractory for small installations, but its use becomes prohibitive in larger quantities due to the high cost of preparation. Refractory mixtures of this type are made up with as much as possible of the fused and a small amount of low burned or plastic magnesia which functions as a binder. Sometimes a small amount of magnesium chloride may be used to assist in cementing together the fused or sintered particles by virtue of a Sorel cement reaction. Crucibles of pure, fused magnesia have been made in Europe for some time and have been found useful for many purposes. The melting point of pure magnesia has been estimated by Kanolt to be 2,800 degrees Cent.

Fused, pure alumina has been used extensively in the manufacture of small crucibles, tubes, furnace linings, cores for winding resistance, heating wires, etc. Its melting point is approximately 2,050 degrees Cent.

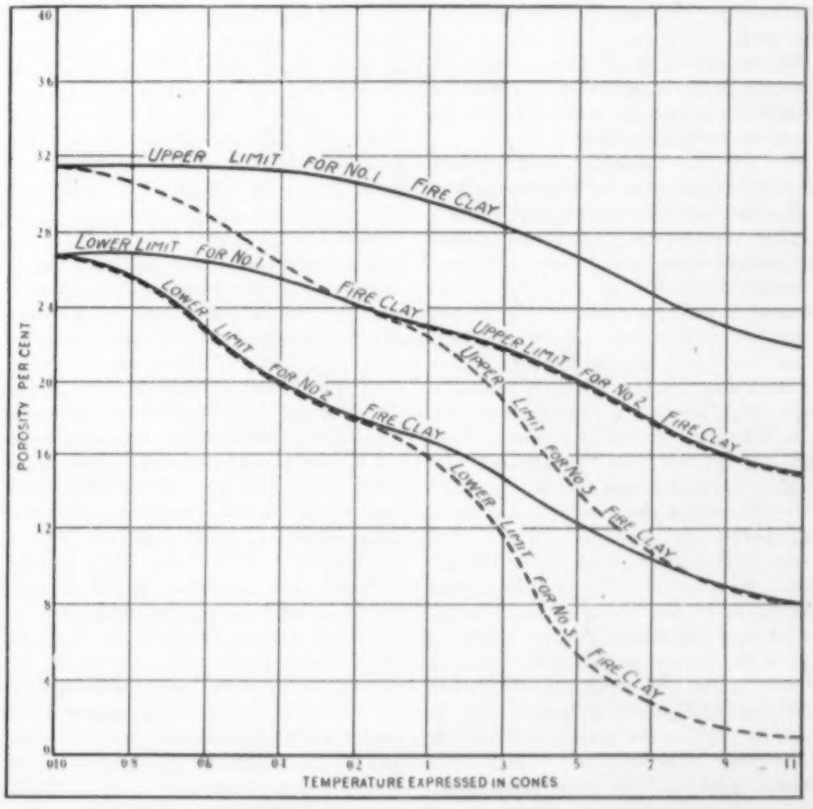

POROSITY PER CENT
TEMPERATURE EXPRESSED IN CONES
UPPER LIMIT FOR NO. 1 FIRE CLAY
LOWER LIMIT FOR NO. 1 FIRE CLAY
LOWER LIMIT FOR NO. 2 FIRE CLAY
UPPER LIMIT FOR NO. 2 FIRE CLAY
UPPER LIMIT FOR NO. 3 FIRE CLAY
LOWER LIMIT FOR NO. 3 FIRE CLAY

FIG. 2—CLASSIFICATION DIAGRAM OF FIRE CLAY, BY PURDY

(Kanolt). Although admirably adapted to many uses, it has certain limitations such as its permeability to gases and the long temperature range below the melting point during which it tends to soften and deform.

One of the rarer, though promising refractories is zirconium oxide, obtained from the Brazilian zircon earth which carries as high as 90 per cent of the oxide, about 4 per cent of ferric oxide and 6 and more per cent of silica. Refractories have been made from this material, the bulk of which consists of the ZrO_2, previously fired to a high temperature, and zirconium hydroxide as a binder which may be supplemented by the use of starch. Such refractories have been found to show no sign of fusion at 2,200 degrees Cent. to be indifferent to temperature changes and to possess high di-electric strength even at high temperatures.

For certain purposes magnesia spinel may be found to be a useful refractory. It corresponds to the formula $MgO.Al_2O_3$ and is prepared by heating to a high temperature a thoroughly blended mixture of 102 parts alumina and 40 of magnesium oxide. Although this compound does not possess a very high melting point it is useful for certain purposes owing to its inertness to dissolving agencies and the absence of any tendency to corrode platinum or other metallic wires. It has been found a useful refractory in several metallurgical researches.

Boron nitride is a rarely used refractory and comparatively little is known concerning its behavior for the purposes under discussion here.

One of the fundamental properties of refractories is a melting or softening point sufficiently high that rigidity of the material is maintained under the temperature conditions involved. Comparatively few of the refractories possess a melting point in the proper sense of the word. Most of them show more or less a certain degree of softening during a given temperature range which may extend throughout several hundred degrees. Thus the rigidity of the substances decreases gradually and at the so-called softening point the viscosity has been diminished to such an extent that deformation takes place under the action of gravity. By molding test specimens in the form of small tetrahedra, corresponding to the shape of the well known pyrometric cones, a condition of softening is established which may serve for purposes of comparison. When the cone bends so that its apex touches the supporting plaque it is said to have gone down or "melted". The temperature at which this takes place is by no means a constant, but varies generally with the size and shape of the cone, the fineness of grinding of the material, the rate of heating and in the case of ferruginous materials, with the condition of the atmosphere, that is, whether reducing or oxidizing. Many basic mixtures made up in the form of cones do not deform in the manner described, but fuse into a round ball or drop. Such behavior is indicative of a real melting point. Owing to the fluctuations in the arbitrary softening point mentioned above it is a misleading practice to speak of the melting point of clays and similar materials. It has been pointed out time and again that the standard Seger cones can be caused to deform at higher or lower temperatures according to whether they are heated rapidly or slowly. It is not uncommon to find, for instance, that such a cone may go down anywhere from 50 to 100 degrees Cent. below the temperature given in the tables by being heated slowly in a commercial furnace or kiln. It would be desirable therefore either to depend upon pyrometric measurements in connection with a definite rate of heating or to establish the real values of the cone softening points under the conditions of use by standardizing with the aid of a good pyrometer. It would be far better to state simply the number of the cone which has gone down under certain conditions than to make use of the "official" temperature given for the same number.

Table I

Deformation of Refractories

No. of specimen	Load, per sq. inch	Contraction in per cent of length at 1,300 deg. Cent.	Contraction in per cent of length at 1,350 deg. Cent.
1	50	1.06	....
1	40	1.06	3.46
1	25	0.35	2.48
1	15	....	1.03
1	0	0	0
2	50	2.17	....
2	40	2.17	3.26
2	25	0.72	1.81
2	15	....	1.45
2	0	0	0
3	50	3.83	....
3	40	3.11	4.82
3	25	1.73	3.50
3	15	....	3.44
3	0	0	10.07
4	50	1.03	....
4	40	0.70	3.86
4	25	0	2.41
4	15	....	1.41
4	0	0	0
5	50	1.80	....
5	40	1.08	3.26
5	25	1.08	2.89
5	15	....	1.08
5	0	....	....

At the present time, electric carbon resistance furnaces are used most frequently for the determination of the softening points of refractories. In the case of refractories quite high in iron oxide erroneous results are obtained in such a furnace due to the reducing action of the carbon monoxide. In vacuum furnaces of this type or by the use of a current of inert gas through the tube containing the specimens this difficulty may be diminished.

Again, by employing molybdenum or tungsten wire electric furnaces and maintaining constant conditions by causing a mixture of hydrogen and steam to flow through the tube, according to the procedure of Fieldner and Hall of the U. S. bureau of mines very satisfactory results can be obtained. It might be stated, however, that such furnaces require skilled attendance and are limited as to the maximum temperature which may be reached. For temperatures up to about cone 32, satisfactory comparative results may be obtained by using a simple pot furnace, heated by means of a gas blast burner and by preheating the air used for combustion. The softening temperature of refractories may be determined by means of optical pyrometers, such as the Holborn-Kurlbaum or the Wanner or it may be estimated by means of the standard pyrometric cones.

Changes in volume due to the shrinkage or expansion of a refractory in use are obviously of considerable practical importance. Such changes are also indicative of the quality of the material. Thus a fire brick which shows a marked shrinkage in use is inferior in quality to a material which shows only a small change in volume. Excessive shrinkage of clay fire bricks is due either to insufficient firing or to inferior quality of the raw materials. Contrary to the opinion of some it is true that the harder a fire brick is burned the more satisfactory it is for most purposes.

Excessive shrinkage may be caused by the inferior refractory quality of the bricks so that upon heating them to higher temperatures more or less pronounced vitrification takes place accompanied by reduction of the pore space and general contraction. The contraction or decrease in porosity of a fire brick at different temperatures may thus be considered a valuable criterion of its quality and when plotted in the form of a curve and data enables us to judge the material quite accurately as to its refractory value. In fact, such information could serve as the basis of a classification of fire clays, as has been suggested by R. C. Purdy, who proposed

the diagram of Fig. 2 for this purpose. Although the limits given by him do not agree with the facts known concerning fire clays at the present time his method of arriving at a basis of comparison for the grading of the various fire clays is thoroughly sound. A study along this line in connection with the best known fire bricks of the United States is now being carried on by the bureau of standards. Based on similar reasoning, it has been proposed to test fire bricks by re-heating them to several temperatures according to their grade and determining their linear contraction. Thus it has been suggested that No. 1 clay fire bricks should be heated to cone 14 (about 2,570 degrees Fahr. and should show a linear contraction of not more than 2 per cent. Similarly No. 2 fire bricks should not contract more than 2 per cent at cone 12 (2,462 degrees Fahr.) and No. 3 materials 2 per cent at cone 8 (2,282 degrees Fahr.). English specifications for gas refractories require that the No. 1 grade shall not contract or expand more than 0.75 per cent, heated to cone 12 for two hours and the No. 2 grade not more than 1 per cent under the same conditions.

Fire bricks also undergo volume changes connected with deep seated molecular changes such as the dissociation of the clay substance into sillimanite at high temperature. The well known decrease in crushing strength suffered by clay refractories upon long heating has been shown by Mellor to be due in part to the growth of crystalline structure. Zoellner, in fact, was able to separate from high grade fire clays burned to a temperature corresponding to cone 15, from 2 to 22 per cent of sillimanite by treatment with dilute hydrofluoric acid. However, the apparent volume changes accompanying these phenomena are slight compared with the contraction due to progressive vitrification.

In silica brick excessive expansion upon reheating is usually due to incomplete transformation of the quartz to cristobalite, a consequence of underburning. Some specifications like those of the American Gas Institute are very stringent with reference to this point and require that upon reheating to 1,500 degrees Cent., the permanent linear expansion shall not exceed 1 per cent. In the case of bauxite or magnesite bricks excessive contraction is likewise due to insufficient burning.

It has already been stated that with increasing temperature the viscosity of refractories decreases. The greater the amount of fluxes present the more marked is this degree of softening. It has been suggested therefore that the deformation at certain temperatures and under given loads be used as a criterion of the refractoriness of fire bricks. Recent work by the bureau of standards on the contraction of fire bricks when reheated to 1,300 and 1,350 degrees Cent. under different loads has given the results shown in Table I.

It follows from these results that the softening of the bricks becomes clearly manifest at 1,350 degrees Cent., which seems to be the more suitable temperature for this test. The load to be employed should not be greater than 40 pounds per square inch and not less than 25 pounds. The requirement as regards deformation must necessarily vary according to the particular use of the bricks. For gas works refractories it has been proposed to specify for grade "*A*" clay fire brick a linear shrinkage not exceeding 2.5 per cent, the test being conducted at 1,350 degrees Cent. and with a load of 25 pounds per square inch. These specifications are exacting and can be met only by well burned fire bricks of excellent refractoriness. The above results are in line with those obtained by Mellor in which he found that the deformation temperature of fire clays is reduced the more the greater the pressure. The same investigator found the relation between the deformation temperature "*T*" and the load "*W*", expressed in pounds per square inch to be expressed by the equation,

$$T = Ce^{-KW}$$

where

C = deformation temperature of specimen of refractory material without load.

K = a constant, the numerical value of which depends upon the particular clay, mode of fabrication, etc.

e = exponential constant.

The temperature may be expressed in degrees centigrade or in terms of Seger cones. The more silicious the clay, the less the difference between the deformation temperatures with or without load. On the other hand, the more the composition of a material approaches that of the pure clay substance the greater is the difference between the deformation temperatures with and without load. The "squatting" temperature of china clay is lowered approximately one cone for every increase of 5¼ pounds per square inch in load.

Silicious clay fire brick and silica bricks are best suited to withstand pressures at furnace temperatures inasmuch as they expand rather than contract and suffer practically no deformation. As far as silicious clays are concerned this holds only for materials low in fluxes. Clays of this type, high in iron oxide and other fluxes, may show decided and sudden contraction at temperatures of about 1,350 degrees Cent.

The structure and density of fire bricks have some influence upon the resistance to load conditions. In flint clay fire brick the proper bonding of the grains is important. Hard burned bricks stand up better than soft fired material.

It is possible, however, to produce high clay fire brick showing excellent

(*Concluded on page* 452)

Table II

Values of K

Kind of fire brick	Degrees Cent. 200	400	600	800	1,000	1,100	1,200
High clay	145	180	220	240	260	270	...
More silicious	115	140	165	190	215	...	...
Silicious	90	110	125	130	130	...	...
Silicious	210	245	270	270	270	270	270
Silica brick	135	160	170	170	180	210	240
Magnesite	110	115	120	130	140	140	...

Table III

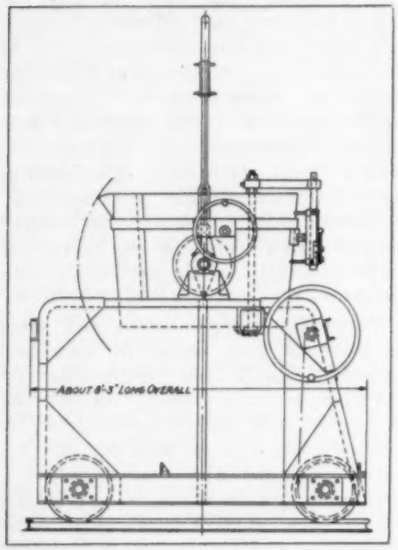
Conductivity Coefficients

Substance.	Thermal conductivity	Porosity, per cent by volume
Fire brick	0.0030—0.0042	24–30
Bauxite	0.0031	41.5
Silica	0.0020—0.0031	42.0
Magnesia (1,300 degrees Cent.)	0.0065	41.0
Grecian magnesite	0.0071	31.5
Carborundum (1,300 degrees Cent.)	0.0145	30.6
Graphite (1,300 degrees Cent.)	0.0185	28.4
Chromite	0.0047—0.0069	21.3
Kieselgur	0.0018	58.0
Porcelain	0.0046	....

Device to Simplify Mold Pouring

Buggy Ladle, Running on Tracks, Straddles the Molds and One Workman Controls All of the Operations Through Two Hand Wheels and One Lever

A BUGGY ladle, developed originally for pouring tool-steel ingots but adapted since that time for foundry work, is now being used in a number of American and Canadian plants. The Ludlum Steel Co., Watervliet, N. Y., is employing five for pouring tool-steel ingots. Among other users are the Hammond Steel Co., Syracuse, N. Y., where three are in service, and Armstrong, Whitworth of Canada, Ltd., Montreal, Que.



SIDE ELEVATION OF BUGGY LADLE

The device was designed by Max Trembour, Ludlum Steel Co., and Thornton W. Price, consulting engineer, New York. At the Ludlum steel plant, where the device was first placed in service, it is pointed out that the labor cost of pouring metal has been reduced two-thirds by the use of this buggy ladle.

The details of the ladle are shown clearly in the accompanying illustrations. The device consists essentially of a framework supported on four wheels which operate on rails. The molds to be poured are placed between the tracks. The ladle is supported on the framework. One operator, standing on a platform at the side, with one hand controls the pouring by means of a lever, and with the other hand propels the buggy forward or backward, as desired, through a hand wheel. The ladle can be tilted by means of another hand wheel.

The ladle, as shown, may be brought to the truck by a crane after the furnace is tapped, or the tracks may be extended to the furnace, and the metal tapped directly into the ladle as it rests on the buggy. Four-sided pyramid castings are provided at each side of the bale ladles. These castings engage with openings in castings on the truck so that as the ladle is lowered, it automatically seats itself on the ladle truck. The position of the bottom-pour spout is thus brought directly into line with the molds.

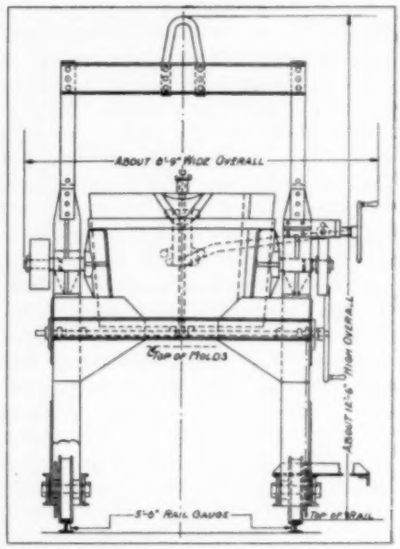
One laborer, standing on the platform shown, can tip the ladle by means of self-locking gearing actuated through a hand wheel, can control the bottom-spout pouring device through a lever, and can move the truck along its tracks by means of a chain drive. Roller bearings are employed to facilitate the movement of the truck. The operator, when turning the wheel with one hand, can propel the truck and loaded ladle about 50 feet per minute.

Skilled Labor Unnecessary

The operator is completely protected from any molten metal which may be spilled, as the side plate of the truck is between him and the metal. A peep hole, covered with mica, is provided in one of the side plates. Through this hole the operator can see the bottom of the pouring spout and the top of the mold. No skilled operator is required with the truck. Between the pouring of heats, this man can be employed on other work around the plant or furnace. The device is operated solely by hand, no electricity being used.

Among the advantages claimed for this device is that only one operator is required. Pouring is said to be speeded up. At the Ludlum plant, for instance, 10 tons of 350-pound ingots have been poured in 1½ minutes. The problem of centering the bottom-pour spout over the ingot or mold is said to be simplified by the ease with which the operator can move the truck in either direction. Any wastage of metal in filling the mold can be avoided as the operator can check the flow immediately when he sees that the mold is filled.

Mr. Price, who has offices in the Woolworth building, has applied for patents on this device. He has arranged to have them manufactured in standardized form.

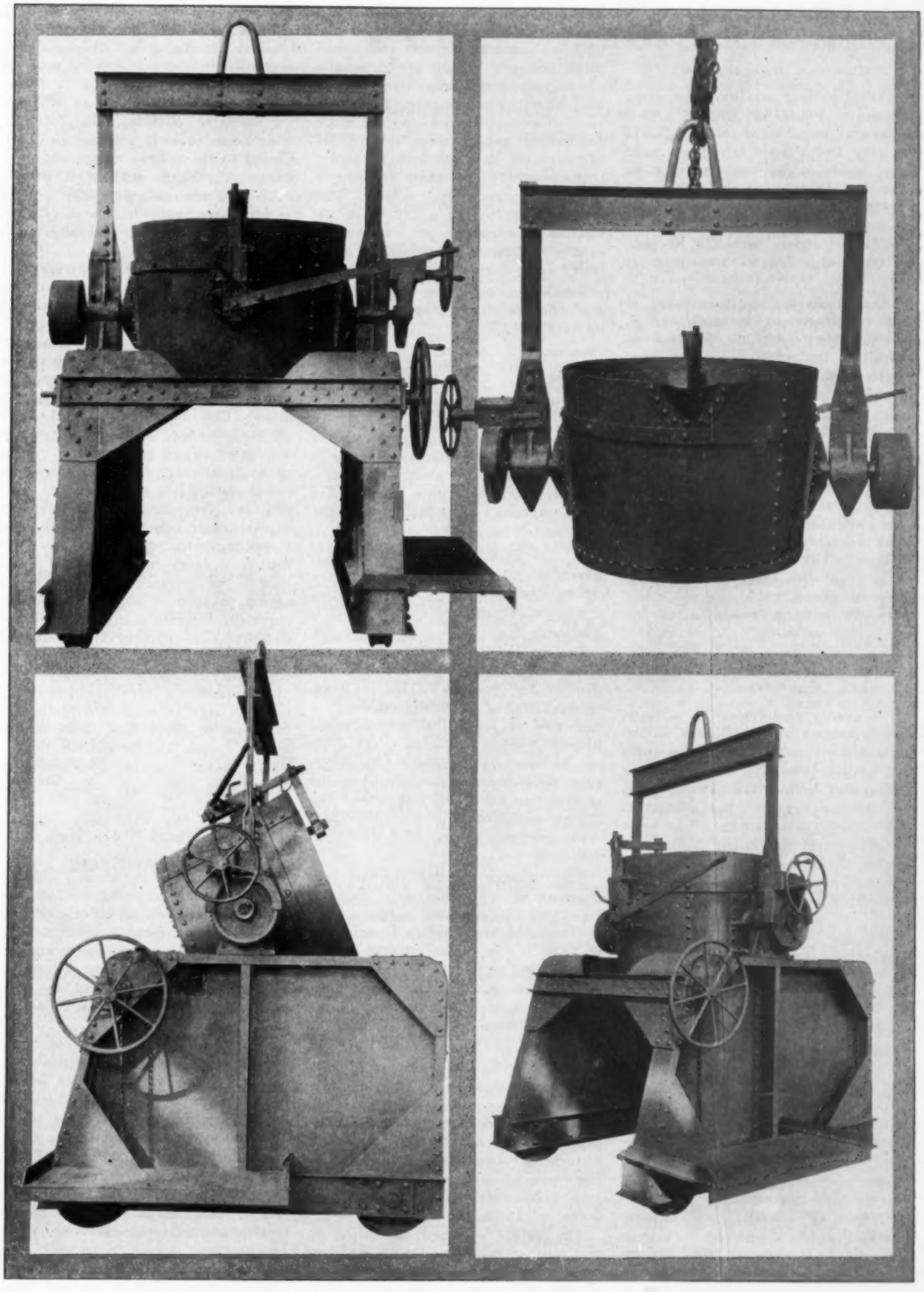


END ELEVATION OF BUGGY LADLE

Creating an Industry

According to *Engineering*, the English output of acetone and acetic acid since the beginning of the war has been increased to a scale where it is no longer necessary to depend on foreign countries for supplies. Enormous quantities of these chemicals are required in the manufacture of munitions. Before the war scarcely any attempt was made to develop this industry owing to the fact that other countries had greater supplies of waste wood available for destructive distillation than England.

Other countries in the British empire have also taken up the question. For instance, it is proposed to erect a factory for this purpose in Natal, where wattle wood will be used as a raw material. The possibility of similarly utilizing the wattle wood accumulated in connection with the wattle bark industry of the East Africa protectorate is also under consideration, and at the Imperial institute an exhaustive series of trial distillations with this wood, and also with olive wood used locally as fuel, has just been concluded.



HAND-OPERATED DEVICE USED FOR POURING SMALL INGOTS AND MOLDS

An Intimate Study of Refractories

(*Continued from page* 449)

resistance to load conditions by using a mixture containing as high a percentage as possible of calcined No. 1 fire clay and a very refractory bond clay. Such bricks have been made under the direction of the writer and were found to possess an exceedingly small contraction with a load of 50 pounds per square inch and at temperatures of 1,350 to 1,400 degrees Cent.

Silica bricks are most resistant to load conditions in furnaces though unfortunately they are subject to difficulties in resisting sudden temperature changes. Silica brick under a pressure of 50 pounds per square inch stand up at temperatures as high as 1,500 degrees Cent. Bauxite bricks unless exceedingly well burned are apt to show decided contraction. Magnesite bricks stand up well at temperatures as high as 1,550 degrees Cent. when they are liable to break down suddenly under loads of about 50 pounds per square inch. Chrome bricks resist this load up to temperatures of about 1,450 degrees Cent., when like the magnesite brick they are apt to fail suddenly.

Resistance to Sudden Temperature Changes

The quality of refractories to resist sudden heating and cooling is an important one and tests dealing with this qualification have been made for a long time by builders of coke ovens and erecting engineers specializing in steam boiler installations. The most common mode of testing consists in heating the fire bricks to a red heat and then dropping them in cold water. The number of such quenchings withstood by the bricks is considered a criterion of their value in this connection. Others heat the bricks to a certain temperature, say 1,000 degrees Cent., and upon removal from the furnace cool them in the air by placing them on an iron plate, which may or may not be cooled by contact with running water. Again others heat the specimens to red heat, remove them and cool them on one side by means of a cold blast of air. It is thus seen that no uniform methods exist and that hence reliable comparisons are not available.

Several of the thermal properties of refractory materials are of considerable practical interest. It must be realized, however, in this connection that none of these properties are constant throughout the range of furnace temperatures. Like all physical constants they vary with temperature and in addition with the mode of manufacture, and such structural changes which are inevitable where refractories are heated for a long time. For instance, the coefficient of expansion of a clay fire brick, determined say between 0 and 100 degrees Cent. does not hold for higher temperatures. The same is true of thermal conductivity, specific heat and other properties. The mean coefficient of expansion of fire brick is usually estimated to be 0.0000097, (referred to 1 degree Cent.).

Boeck has found the coefficient for a plastic fire clay, burned to cone 12, to vary as follows:

Temp. range, degrees, Cent.	First run	Second run
24 to 100.....	$1{,}316 \times 10^{-8}$	$1{,}310 \times 10^{-8}$
100 to 200.....	$1{,}710 \times 10^{-8}$	$1{,}610 \times 10^{-8}$
200 to 700.....	558×10^{-8}	580×10^{-8}
200 to 900.....	.....	567×10^{-8}

The specific heat of refractories has not yet been determined satisfactorily for a number of such substances. For clay fire brick this relation has been expressed by Mellor by the equation:

$$S = 0.193 + 0.00006t$$

where

S = specific heat.

t = temperature, in degrees centigrade.

The thermal conductivity of the materials under discussion is a direct function of the porosity. Thus a dense brick showed at 1,400 degrees Fahr. a heat flow of 124 British thermal units through 1 square foot area, 1-inch thick, per 24 hours, for a temperature difference of 1 degree Fahr. A somewhat more porous brick, under the same conditions conducted 87 and a "kieselgur" brick, extremely porous, 22 British thermal units.

The variation of the thermal conductivity of fire bricks with temperature and reheating is illustrated by the work of Heyn which is compiled in Table II. Here the value of K represents the heat flow in calories per second through 1 square centimeter and 1 centimeter thickness, per 1 degree Cent, temperature difference. The figures are of the order, $K = 0.001 = 100$.

According to the well known results of Wologdine the absolute thermal conductivity coefficients (gram calories per second, through 1 square centimeter area and 1 centimeter thickness, for 1 degree Cent., temperature difference) have been found as given in Table III.

The values obtained for silica do not seem to correspond with the facts as they are known concerning commercial silica brick which have repeatedly been found to be better heat conductors than clay refractories. Our general knowledge concerning the thermal qualities of refractories is still decidedly deficient and is in need of much further work.

The molecular equivalents of silica are likewise obtained, that of alumina being equal to unity in all cases. Owing to the tedious nature and difficulties of silicate analysis it is evident that physical tests, the results of which are available in a short time, are preferable to chemical determinations.

In using refractories the quality of the mortar used is of great importance. In each case the mortar should approach very closely the composition and grade of the refractory. Highly refractory materials should be laid up with mortar of corresponding quality and with joints as thin as possible. The use, for instance, of a low grade fire clay in connection with high grade fire bricks is bound to be injurious. Attention might be called also to the use of special mortars and cements for such purposes as securing impervious joints and protecting refractories from the infiltration of gases or corrosion of slags. Where, for instance, units are to be united to form a compact structure, porcelain cements containing feldspar or other non-corrosive fluxes may be very valuable. Again by coating brick work with a cheap, refractory glaze of the porcelain type impermeability to gases may be secured. By the use of a suitable silicate flux of the desired acidity, it may also be possible to protect refractory surfaces from corrosion by slags or glass.

Bench-Board Switches Are Standardized

Improvements suggested by the continued use of bench-board switches have led the General Electric Co., Schenectady, N. Y., to change the design of these instruments so as to eliminate several parts, and to effect standardization. Standardized designs now completed include an open type of board; a closed type of board, with back panels in two or three sections; a closed type, with back panels; and a control bench for installation in front of instrument and meter panels. The standard widths of the new sections are 24, 28, 32, and 40 inches. All boards are designed to permit of further extensions at either end. The grille panels back of the instruments are easily removable and provide convenient places for mounting graphic instruments, motors and similar devices. Ventilation screens are provided to prevent excessive heating from lamps and resistors.

Foundrymen Plan Notable Meeting

Official Program Announced for Boston Convention Contains Wide Selection of Subjects Applicable to Industry—Munition Making to be Discussed —Exhibition Promises to be Largest in History

COMPLETE official programs for the annual conventions of the American Foundrymen's Association and of the American Institute of Metals which will meet jointly at Boston, Sept. 24 to 28, have been announced. The professional sessions of the American Foundrymen's Association will take place in the Mechanics' building, chiefly in the Paul Revere hall, and those of the American Institute of Metals at the Hotel Somerset. The program of papers on technical, commercial and operating topics is unusually comprehensive this year and it covers many of the practical problems which are being met today by the foundryman and metallurgist. Separate sessions will be devoted to steel, pig iron and malleable iron.

The social features will include a boat ride in and about Boston harbor, Tuesday afternoon, luncheon being served on board; baseball game Wednesday afternoon between the Boston and Cleveland American League teams; theater party Wednesday evening; visit to the West Lynn plant of the General Electric Co., Thursday noon, and at the same time luncheon to the ladies; and annual banquet at the Copley-Plaza hotel, Thursday evening.

The exposition of foundrymen's equipment and supplies to be held in the Mechanics building will be the largest ever given. Already 145 different companies have reserved space totalling 45,000 square feet. This is considerably in excess of the Cleveland exhibition last year.

The complete program of the American Foundrymen's Association is as follows:

Monday, Sept. 24.

10:00 a. m.—Registration, Mechanics' building.

1:00 p. m.—Opening of exhibition, Mechanics' building.

3:00 p. m.—Joint opening session, American Foundrymen's Association and American Institute of Metals, Paul Revere Hall, Mechanics' building.

Address of welcome, by Hon. James M. Curley, mayor of the city of Boston.

Response to the address of welcome, by R. A. Bull, Duquesne Steel Foundry Co., Coraopolis, Pa.

Annual address by J. P. Pero, Missouri Malleable Iron Co., East St. Louis, president, American Foundrymen's Association.

Annual address by Jesse L. Jones, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., president, American Institute of Metals.

Report of executive board of the American Foundrymen's Association.

Report of the secretary-treasurer of the American Foundrymen's Association, by A. O. Backert, Cleveland.

"Fire Prevention in Large Industrial Establishments," by C. W. Johnson, Westinghouse Electric & Mfg. Co., East Pittsburgh.

Appointment of nominating committee and committee on resolutions.

Tuesday, Sept. 25, 10:00 a. m.

"The Foundry from the Viewpoint of the Sales Engineer," by H. B. Atwater, Osborn Mfg. Co., Cleveland.

"The Relationship of the Engineering Department to the Pattern Shop and Foundry," by F. J. McGrail, Struthers-Wells Co., Warren, Pa.

"How Character Analysis Solves the Man Problem," by William Judson Kibby, employment specialist, Cleveland.

Report of A. F. A. committee advisory to the U. S. Bureau of Standards, by Richard Moldenke, chairman, Watchung, N. J.

"Efficiency in the Foundry," by James A. Fitzgerald, Reno, Pa.

"Co-Operative Shop Training," by W. B. Hunter, Fitchburg High School, Fitchburg, Mass.

Wednesday, Sept. 26, 10:00 a. m.

"Improving the Relationship Between Employer and Employe," by J. F. Kent, American Cast Iron Pipe Co., Birmingham, Ala.

Report of A. F. A. committee on safety, sanitation and fire prevention, by Victor T. Noonan, chairman, industrial commission of Ohio, Columbus, O.

Report of A. F. A. committee on foundry costs, by B. D. Fuller, chairman, Westinghouse Electric & Mfg. Co., Cleveland.

Report of A. F. A. representatives on the conference board on training of apprentices, by Frank M. Leavitt, chairman, University of Illinois, Chicago.

"The Labor Situation as Relating to Co-Operation Between the Employer and Employe," by G. E. MacIlwain, Babson's Statistical Organization, Wellesley, Mass.

"Micro-Metallography for the Foundry," by Robert J. Anderson, Cleveland Metal Products Co., Cleveland.

Report of nominating committee and election of directors.

Malleable Session, 10:00 a. m.

"The Theory of the Modern Waste-Heat Boiler and Possible Application of Such Boilers to the Malleable Melting Furnace," by A. D. Pratt, the Babcock & Wilcox Co., New York.

"Application of Waste-Heat Boilers to the Malleable Melting Furnace," by C. D. Townsend, Danville Malleable Iron Co., Danville, Illinois.

"Application of Pulverized Coal to the Air Furnace," by W. R. Bean, Naugatuck Malleable Iron Works, Naugatuck, Conn.

"The Application of Pulverized Coal to Malleable Melting Furnaces," by Joseph Harrington, advisory engineer, Chicago.

"How Malleable Iron Has Improved," by Enrique Touceda, consulting engineer, Albany, N. Y.

"Troubles Encountered in Machining Malleable Iron: Causes and Remedies," by A. T. Jeffery, Dayton Malleable Iron Co., Dayton, O.

"Comparative Carbon Losses in Malleable Iron Annealing by Muffle and Pot Oven Methods," by Joseph B. Deisher, the T. H. Symington Co., Rochester, N. Y.

"The Effect of Iron Oxide in Molding Sand," by W. R. Bean, Naugatuck Malleable Iron Works, Naugatuck, Conn.

Thursday, Sept. 27, 10:00 a. m.

GRAY IRON SESSION

"Note on Fine Molding Sands," by C. P. Karr, associate physicist, U. S. bureau of standards, Washington.

Report of A. F. A. committee on general specifications for gray iron castings, by W. P. Putnam, chairman, Detroit Testing Laboratory, Detroit.

"Briquetting Foundry Borings," by A. L. Stillman, General Briquetting Co., New York.

"Cast Iron Shells in Permanent Molds," by Edgar Allen Custer, consulting engineer, Philadelphia.

"The Seasoning of Gray Iron Castings," by L. M. Sherwin, Brown & Sharpe Mfg. Co., Providence, R. I.

"Factors in the Economical Production of Small Cores in Large Quantities," by R. E. Kennedy, University of Illinois, Urbana, Ill.

"Modern Centrifugal Cupola Blowers," by J. W. Shugg, General Electric Co., Schenectady, N. Y.

"The Effect of High Sulphur in Gray Iron Castings," by T. Mauland, International Harvester Co., Chicago.

Steel Session, 10:00 a. m.

"Molding and Casting Large Slag Pots," by C. J. McMahon, Illinois Steel Co., Chicago.

"A Description of a Small Open-Hearth Furnace," by David McLain, McLain's System, Milwaukee.

"Small Steel Castings for Ordnance Purposes," by Major C. M. Wesson, Watertown arsenal, Watertown, Mass.

"A New System of Burning Crude Oil," by W. A. Janssen, Davenport, Iowa.

"The Use of Vanadium in Steel Castings," by J. Lloyd Uhler, Union Steel Castings Co., Pittsburgh.

"Report of A. F. A. Committee on Steel Foundry Standards," by W. A. Janssen, chairman, Davenport, Iowa.

12:00 m.—Luncheon for the ladies, followed by an automobile trip.

12:30 p. m.—Visit to the West Lynn plant of the General Electric Co. Luncheon will be served at the works.

Friday, Sept. 28, 10:00 a. m.

"Solution of Foundry Transportation and Conveying Problems," by Robert E. Newcomb, Deane Works, Worthington Pump & Machinery Corp., Holyoke, Mass.

"Sand-Blasting in the Foundry," by H. L. Wadsworth, Sand Mixing Machine Co., Cleveland.

"Results of Tests in Blending and Mixing Sand by Means of Mullers," by R. F. Harrington, Hunt-Spiller Mfg. Corp., Boston.

"Factors Contributing to the Economical Use of Grinding Wheels in the Foundry," by

Wallace T. Montague, Norton Co., Worcester, Mass.

"Refractory Materials Employed in the Metallurgical Industries," by H. C. Arnold, University of Illinois, Urbana, Ill.

Steel Session, 10:00 a. m.

"Electric Furnace Design," by John A. Crowley, John A. Crowley Co., Detroit.

"Recent Developments in the Application of the Electric Furnace to the Melting Problem," by Douglas Walker, Booth-Hall Co., Chicago.

"Comparison of Electric Furnace and Steel Converter for the Manufacture of Small Steel Castings," by C. R. Messinger, Sivyer Steel Casting Co., Milwaukee.

"The Electric Furnace from the Central Station Standpoint," by E. L. Crosby, Detroit Edison Co., Detroit.

"The Electric Furnace in the Iron and Steel Foundry," by Max Trembour, metallurgical engineer, Ludlum Steel Co., Watervleit, N. Y.

The official program of the American Metal Institute is as follows:

Monday, Sept. 24, 10:00 a. m.

10:00 a. m.—Registration, Mechanics' building.

3:00 p. m.—Joint opening session American Foundrymen's Association and American Institute of Metals, Paul Revere Hall, Mechanics' building.

Tuesday, Sept. 25, 9:30 a. m.

MELTING AND CASTING NONFERROUS METALS

"Raw Materials Used for Crucibles," by Prof. A. V. Bleininger, bureau of standards, Washington.

"Melting Yellow Brass in New Form of Induction Furnace," by G. H. Clamer, Ajax Metal Co., Philadelphia.

"Casting Bearings in Sand and Metal Molds," by R. R. Clarke, Pennsylvania Lines West of Pittsburgh, Pittsburgh.

"Negative Experiments on Waste Core Sand," by Dr. H. W. Gillett, bureau of mines, Ithaca, N. Y.

"The Crucible Situation," by M. McNaughton, Jos. Dixon Crucible Co., Jersey City, N. J.

"The Electric Furnace and Nonferrous Metals," by Dwight D. Miller, the Society for Electrical Development, New York.

"My Experience with Metal Melting Furnaces," by W. H. Parry, National Meter Co., Brooklyn.

"The Briquetting of Nonferrous Light Metal Scrap," by A. L. Stillman, General Briquetting Co., New York.

Wednesday, Sept. 26, 9:30 a. m.

USES OF NONFERROUS METALS FOR MUNITIONS, ETC.

"The Present Status of Tin Fusible Plug Manufacture and Properties," by Dr. Geo. K. Burgess, bureau of standards, Washington.

"Stellite," by Elwood Haynes, Haynes Stellite Works, Kokomo, Ind.

"The Use of Die Castings in Munitions," by Chas. Pack, Doehler Die Casting Co., Brooklyn.

"Shrapnel Bullets," by Harold J. Roast, the Jas. Robertson Co., Ltd., Montreal, Que.

"A Few Points on Alloy Patents," by Wm. J. Rich, patent office, Washington.

Address by a representative of the United States tariff commission.

"The Use of Bronzes in Railroad Turntables and Movable Bridges," by O. E. Selby, Big Four railroad, Cincinnati.

"Recent Industrial Uses of Aluminum," by F. G. Shull, Aluminum Co. of America, Boston.

"The Consumption of Copper and Its Varied Uses," by H. D. Hawks, United Metals Selling Co., New York.

Thursday, Sept. 27, 9:30 a. m.

TESTING OF NONFERROUS METALS

"Comparative Tests on Test Bars and Actual Castings," by W. M. Corse, Titanium Bronze Co., Niagara Falls, N. Y.

"Analysis of Babbitts and Brasses," by E. W. Hagmaier, Buffalo.

"Standard Test Bars of 88-10-2 and 88-8-4, being the result of co-operative work of six foundries; a new series of tests," by C. P. Karr, bureau of standards, Washington.

"The Expansion Coefficients of Alpha and Beta Brass," and "The Corrosion of Manganese Bronze under Stress," by Dr. Paul D. Merica, bureau of standards, Washington.

"Corrosion of Brasses of the Muntz Metal Type," by H. S. Rawdon, bureau of standards, Washington.

Address by Richard C. Maclaurin, president, League to Enforce Peace.

"The School End of the Job in Training Foundrymen," by Dean C. B. Connelley, Carnegie Institute of Technology, Pittsburgh.

"The Flux and Cleaner Question of Brass," by E. D. Frohman, S. Obermayer Co., Pittsburgh.

"Pyrometers—Their Construction and Application," by John P. Goheen, Brown Instrument Co., Philadelphia.

"Electrically-heated Core Ovens," by Dr. C. F. Hirshfeld, Edison Illuminating Co., Detroit.

"Brass Rolling Mill Alloys," by Roy A. Wood, Cheshire, Conn.

Friday, Sept. 28, 9:30 a. m.

METALLURGY AND METALLOGRAPHY

"The Electrolytic Production of Antimony," by Prof. D. J. Demorest, Ohio State University, Columbus, O.

"The Electrical Properties of Some High Resistance Alloys," by Prof. M. A. Hunter, Rensselaer Polytechnic institute and F. M. Sebast, Troy, N. Y.

"The Amorphous Theory in Metals," by Zay Jeffries, Aluminum Castings Co., Cleveland.

"The Volatility of Zinc and Cadmium," by John Johnston and Edward Schramm, American Zinc, Lead & Smelting Co., St. Louis.

"Surface Tension and Deoxidizing of Metals," by W. J. Knox, Metals Deoxidizing & Refining Co., New York.

"Antimony—Its Metallurgy and Uses," by K. C. Li, Wah Chang Mining & Smelting Co., Inc., New York.

"Development and Reabsorption of the Beta Constituent in Alloys which are Normally of the Alpha Type," by Prof. C. H. Mathewson, department of mining and metallurgy, Yale University, and Philip Davidson, New Haven, Conn.

"The Swelling of Zinc Base Die Castings," by H. M. Williams, National Cash Register Co., Dayton, O.

Completes New Plant

The new plant of the Keller Pneumatic Tool Co., Grand Haven, Mich., has been completed and arrangements have been made to begin during September the removal of the equipment from the old plant at Fond du Lac, Wis. The new plant has been laid out in units. It is planned to remove one unit from the old plant at a time and in that way present production will be maintained. W. H. Keller is president and general manager of the company; William H. Loutit, vice president, and Arnold J. Petri, secretary and treasurer.

Obituaries

Harry J. Cantwell, of St. Louis, formerly prominent in Missouri lead mining, died Aug. 20 at Hot Springs, Ark. At one time he was head of the St. Joseph Lead Co.

Eugene H. Taylor, mechanical engineer and a director of the John T. Robinson Co., Hyde Park district, Boston, maker of paper box machinery, was killed by being thrown from an automobile in that city Aug. 22. He was 60 years old.

Major Henry Souther, formerly vice president of the Ferro Machine & Foundry Co., Cleveland, and more recently commissioned a major in the army and appointed an officer in charge of the Langley aviation field by Secretary of War Baker, died at Fort Monroe hospital Aug. 22, aged 52 years.

Moses W. Redshaw, assistant superintendent and for 45 years an employe of the Singer Mfg. Co., Bridgeport, Conn., died in a hospital in that city, Aug. 22, as a result of injuries received by falling down an elevator well in the factory earlier in the day. He was 65 years old.

George C. Blickensderfer, vice president of the Blickensderfer Mfg. Co., died at his home in Sound Beach, Conn., Aug. 15, aged 66 years. He was the inventor of a typewriter which bears his name and also since the beginning of the war, had invented many devices now in use by makers of munitions and equipments.

George Bernard Grant, who died in Pasadena, Cal., Aug. 16, was the founder of the Grant Gear Works, Boston. For years he also had gear-cutting shops in Cleveland and Philadelphia. He retired from the active management of his business several years ago and had since devoted much of his time to his various inventions, several of which he had patented. He was 68 years old and had been in failing health for some time.

Arthur Kneisel, national treasurer for the American Association of Engineers, died in Chicago, Aug. 17. He was one of the original promoters of the association and was secretary up to this year. Mr. Kneisel was born in Lexington, Ky., in 1880, where he received his early education, later graduating from the University of Kentucky. At the time of his death he was president of the Utilities Development & Sales Co.

British Watch Embargo Situation

Show Much Interest in Cable of The Iron Trade Review on Attitude of Government Toward Exports—Further Wage Claims Are Adjusted—Changes in Control of Iron Works Are Announced

Bureau of THE IRON TRADE REVIEW,
Princes Chambers, Corporation street,
Birmingham, England, Aug. 10, 1917.

LITTLE is to be said about the steel position. Nearly all output is absorbed for war purposes, and there is very keen inquiry for the small margin available for general purposes. Naturally, a good deal of interest is taken in the news, conveyed by THE IRON TRADE REVIEW cable this week, of the government embargo on exports. It is assumed, however, in view of frequent expressions on behalf of America, and the absolute community of aims between the two countries, that this embargo will not prevent the shipment of whatever steel is necessary for the united prosecution of the war. The South Wales tin plate trade appears to be approaching the vanishing point. Recent records of shipments, as well as of stocks, are the lowest figures published for years.

Plenty of War Material

Holidays have been general this week in the iron and steel trades, most of the Sheffield firms shutting down on Friday night. The fact that the ministry of munitions has practically left the makers of iron and steel and its various products a free hand to determine the length of their holidays shows that there is no shortage of war material. In many cases 10 days stoppage has been taken. Unfortunately, there still is some fuel scarcity which has tended to lengthen the holiday.

The Midland wages board once more has proved itself useful in handling knotty wages problems. Wages both in the north of England and in the Midlands for many years past have been regulated by sliding scale; but the scale only operates upon the actual makers of the metal such as forgemen and millmen. Blast furnacemen have usually followed this scale, although very few furnace owners, at least in the Midlands, are connected with the board. The scale does not affect the large numbers of laborers, helpers and more or less skilled or semi-skilled men whose operations are essential to efficient production. Recently the operative section of the Midland wages board requested that this army of helpers should be brought under the scale. The proposition was somewhat formidable, seeing that percentage advances since the war are somewhere between 60 and 70 per cent. The application was considered at a meeting of the wages board in Birmingham and was fully debated. Many of the men already have had adjustments which made it impossible to include them in a general advance. A recent concession adopted by the Engineering Federation allows 3s 2d per week to its general workers and 1s 6d (36c) to youths. The employers offered to pay this to ironworks helpers, and odd men generally, beginning Aug. 1. They did not, however, respect finally the men's claim to be included in the sliding scale, stating that so big a proposition required careful deliberation, and they asked for a two months' postponement. The operative section accepted the offer.

The iron founders who turn out heavy mill plant and furniture have found it necessary to advance grain and chilled rolls £1 ($4.80) per ton as the result of the large addition to the cost of production arising from dearer material, fuel and increased wages.

The firm of J. B. & S. Lees of the Albion & Nelson Ironworks, West Bromwich, is to be turned into a limited company. The present proprietor, John Lees, succeeded his father, the late John Bayley Lees, some years ago, but since the war broke out has been almost continuously in the army. He has been twice wounded, once dangerously, and at the present time has not fully recovered. Joseph Belcher, who for many years has represented the firm on the Birmingham exchange, will become a director.

The holidays slightly have reduced temporarily the consumption of pig iron, and the continued blowing of the furnaces has enabled the smelters to overtake demand to some little extent. The consumption is so large that pressure for supplies is constant. Cleveland, which has been only moderately active for a week or two, is finding plenty to do in the way of negotiation of new business, a great deal of which is now arranged at the beginning of each month. Consumers are buying to meet their allotments, and the authorities take care that they do not exceed these. There are consequently no reserves, and all the iron made is going into consumption, with very modest shipments for the allies. Foreign orders, however, are still in arrears, and our allies would be very glad if they could have larger supplies. The east coast hematite pig iron supply chronically is below requirements. All sales of pig iron are at the maximum prices. The west coast business is showing very similar conditions. The demand there constantly increases, chiefly because of the enormous extension of the shipbuilding and naval demand. The supply of raw material is insufficient, and labor is continuously short.

Foundry Iron Grows Scarcer

In the Midlands, the pig iron market is firmer than ever, with a rigid restriction of contracts by smelters, who have the greatest difficulty to meet the requirements of their customers. Makers of all brands could take on larger orders, if they were in a position to do so. Undoubtedly, the position has become more and more stringent, through the constant transfers of furnaces to the production of basic.

One of the best-known black country concerns has recently changed hands, and it is believed that this is the beginning of an important new South Staffordshire enterprise. Messrs. Bradley's Caponfield Ironworks, Bilston, have been sold to a group of buyers, which include W. J. Foster, manager of Messrs. Bradley's Darlaston Green Ironworks, and Richard Thomas, the tin plate magnate of South Wales. The intention is to erect a steelmaking works in connection with the furnaces. The locality is not far removed from the steel works of Alfred Hickman, Ltd., and the new development is considered very interesting locally, as indicating that the black country is to be more and more a steelmaking, rather than an ironmaking, center.

The ministry of munitions has issued an order prohibiting the buying or selling of blast furnace dust except under a license by the controller of potash production. Returns are to be rendered of all stocks and dealings to the controller and samples are to be submitted when required for his examination.

Price Question For Allies Still Open

Buying Authority Conferred on War Industries Board by England, France and Russia Represents Formal Action Along Expected Lines—Widely Circulated Report of Naming of Steel Buying Director is Denied

WASHINGTON, Aug. 28.—Nothing especially significant is to be drawn from the formal acknowledgment last week of three of the allies, England, France and Russia, of the authority of the central purchasing commission of the American war industries board to supervise the buying for them of war materials and supplies in this country. Italy and others of the allies are expected soon to give this board similar authority. At the time the council of national defense was reorganized and the commission created, it was announced it would make the purchases for the allies. On Aug. 8, when the war industries board stated its position on prices, it again was declared the commission would be the allies' agent.

Price Question Left Open

Secretary McAdoo's statement, telling of the approval of the United States and the three allies, aside from saying the commission "will thereby be able to thoroughly co-ordinate the purchases of the United States government with the purchases of the allies," made no reference to prices. The co-ordination referred to is taken to mean that buying through one central agency, the allied governments likely will not duplicate orders or buy unnecessarily.

Developments in the past week have left undenied the current rumors concerning the abandonment of the plan to buy for all the allied nations and the general public at the same prices the United States government will pay. Newspapers which supported the President's plan of one price for all, have been less insistent and some have even gone so far as to admit the plan may have to be abandoned. This, in the face of the President's action on coal, is encouraging to opponents of the one-price theory. The report that American manufacturers, particularly steelmakers, would not even consent to letting the government fix the prices on its own orders was nothing but another vicious attack on the trade.

Steel mills will let the American government have all the steel it needs and, if necessary, will make sacrifices, even in costs, to supply this need. But it is not believed the government will be so unfair as to go that far. And while, it must be remembered, that the President, as commander in chief of the army and navy, can do as he pleases to supply the military branches of the government without further legislation, neither he, the war industries, the federal trade commission, nor any other department of the government can, under present laws, compel American industry to sell to any foreign government or the American public, at a figure lower than that agreed upon by the governments and manufacturers involved in the transaction. This is true of every thing except food and fuel which are regulated by the food control bill.

It is to be expected that the purchasing commission, armed with the appeals of the President and the war industries board, will ask American manufacturers to sell at as low a figure as possible, especially in view of the fact that all war orders, no matter by whom purchased, are for the suppression of the common enemy. And it is also generally believed the manufacturers will respond with quotations lower than they ordinarily would be.

The commission agreed to by the allies is identical with the war industries board's commission. The members are: Bernard M. Baruch, chairman, Robert S. Lovett and Robert S. Brookings. These men, with Frank A. Scott, who is chairman, Rear Admiral F. F. Fletcher, Lieut. Col. Palmer E. Pierce, and Hugh Frayne, constitute the war industries board. The purchasing commission now is really an international body.

Replogle Not Named Director

The report current last Friday that J. Leonard Replogle, chairman of the Wharton Steel Co., had been appointed and was already in office as the official purchaser of steel for America and the allies, due to the unfortunate policy of the government officials in giving out news and confirming or denying reports, was allowed to go so long without denial that it was pretty generally accepted as a fact in Washington and by individual interests.

After the rumor had grown from "probably will be" to "has been," Mr. Baruch issued the following denial:

"Mr. Baruch simply invited Mr. Replogle to come to Washington to advise with him on steel and steel matters. As far as the stories carried in the morning papers, about Mr. Replogle being appointed director or dictator, there is nothing to it."

Huge Shipping Program Still is Growing

WASHINGTON, Aug. 28.—Request of congress for an additional $1,134,500,000 to enable the Emergency Fleet Corp. to go ahead with its shipbuilding program and the awarding of contracts for government-owned shipyards, are expected to be made this week. Secretary McAdoo now has under consideration the shipping board's financial needs and the board itself is going over plans for the new yards, which, according to latest reports, are to be three instead of two as originally planned and announced by former General Manager Goethals. While that portion of the shipping board's plans made public does not say a word about the proposed plants for the fabrication of ship steel, it does make known what the board wants to accomplish, as to the number of vessels, and their aggregate tonnage and it gives an estimate of their cost. This sets at rest any doubt as to what the board, acting through the fleet corporation, actually intends to do.

The request for the additional appropriation would make the total sum available for use by the board $1,934,500,000. This includes $50,000,000 authorized when the construction end of the shipping board was incorporated and $750,000,000 given the Goethals-Denman administration for actual construction purposes. The new request greatly exceeds all sums which it was supposed the board would require. This appropriation would give the board at least 1272 ships whose tonnage would much exceed 7,968,600, the total tonnage of the ships actually to be built.

Chairman Hurley in his statement to Mr. McAdoo said 433 ships, with a total of 1,919,200 tons and at a cost of $285,000,000, already have been con-

tracted for and now are in one stage or another of construction. Contracts already have been drawn, but not let, for 452 more vessels of a total of 2,968,000 tons. These will be formally awarded as soon as the board gets the $455,500,000 needed for their construction. Besides these, the board is negotiating for 237 more, which would add 1,281,400 tons and entail an expenditure of $194,000,000. In addition, under the classification of "miscellaneous", the board contemplates eventual ownership of 150 more ships, which would produce 1,800,000 more tons and involve $300,000,000 more.

These sums, increased by $35,000,000, Mr. Hurley says, is needed for administrative purposes, which may mean for building the proposed shipyards, make a total of $1,269,500,000. Of this, $550,000,000 of the money already available either has been used or has been definitely set aside for the purpose named. This would leave $719,500,000 actually needed for carrying out the shipbuilding program. The other $250,000,000 of the original $800,000,000 is being or is to be used for commandeering ships other than those contemplated in the construction scheme. In addition to this, the board wants $265,000,000 for further commandeering, which would make a total of $515,000,000. For purchasing still other ships, the board wants $150,000,000 more. Without knowledge of just what ships the board actually intends to purchase with this $150,000,000, it is almost impossible to estimate the number and the tonnage which would be added to that obtained through construction.

Believe Steel Ships Favored

While the board is withholding announcement of its intentions as to whether steel or wooden ships will prevail in future contracts, it is generally believed that Mr. Hurley's manufacturing experience and the knowledge Admiral Capps, general manager of the Emergency Fleet Corp., gained as naval constructor, argue in favor of steel ships. In this connection, and in view of the pending contracts for fabricating yards, there is an interesting bit of speculation as to which of the contemplated expenditures will be actually for steel vessels.

The average cost of vessels already contracted for, based on Mr. Hurley's statement to Mr. McAdoo, is $658,000. The average of those under negotiations, which undoubtedly contemplates some steel craft, is $819,000. Of those already to be contracted for, the cost averages $1,007,000 each, which also allows for other ships of steel. This eliminates ships being built and proposed down to what Mr. Hurley terms "miscellaneous". The 150 ships, costing the $300,000,000 designated, would average $2,000,000 apiece. This gives rise to the belief that owing to this, the high average, possibly part of the money, is to go for the construction of the proposed plants and the remainder for the ships to be built in these yards.

It is generally accepted here that if the shipping board contracts for two yards they will be given to two of the following three corporations, and if three are to be built, one each will go to the American International Corp. for a plant at Hog Island, Pa., the Merchants Shipbuilding Co. for a yard at Chester, Pa., and the Submarine Boat Corp. for a plant at Newark, N. J. This belief, however, does not allow for the possible award to the Federal Shipbuilding Corp. at Hackensack, N. J.

Report on Water Shipment of Southern Iron

Washington, Aug. 28.—Results, with the exception of cost details, of shipping pig iron from Sheffield, Ala., to Peoria, Ill., by inland water route, have been announced by the government. The expense involved will not be made public until two or three more similar experiments have been made and then the details will be published with the government's recommendations as to future shipments of this kind. The object of the experiments is the development of inland waterways for commercial purposes, made necessary through overburdening of the railroads as a result of the war.

The experiment shipment was of 1200 tons of pig iron from the furnaces of the Woodward Iron Co., Woodward, near Birmingham, Ala., to the plant of the Keystone Steel & Wire Co., at Peoria. The pig iron was hauled in 33 cars by rail from Woodward to Sheffield where it was loaded into three barges in tow of the ENTERPRISE. The cargo left Sheffield July 21 and reached Peoria Aug. 1, after covering approximately 681 miles by water. The trip was without incident save for a brief delay at Copperas creek lock in the Illinois river where the shallow channel made necessary reloading some of the pig iron into a fourth barge.

The government has since assigned a dredge to deepen the channel at this point and has ordered the engineering branch of the war office to see that the entire route, which traverses the Tennessee, Ohio, Mississippi and Illinois rivers, is kept free from obstruction for future shipments. Capt. W. S. Winn of the engineering corps, supervised the experiment. The war and commerce departments authorized the test.

Await Government Action on Coke Prices

Washington, Aug. 28.—Dr. Harry A. Garfield is to let the coal situation remain where President Wilson put it last week until the price of wheat, which comes under Dr. Garfield's jurisdiction by virtue of his chairmanship of the wheat committee of the food administration, has been established.

Announcement of Dr. Garfield's plan to make lower prices for coal consumers will probably mean lower prices on coke, although the coke situation has not been developed under the food control bill and may have a separate administrative committee under Dr. Garfield. Attention of the iron and steel and the coal and coke trade has been turned in this direction. Coke producers have forwarded their costs to the federal trade commission and action is keenly awaited.

Decisions of the President established prices f. o. b. mines for both anthracite and bituminous coal and also allowed compensation of coal jobbers, effective Sept. 1. The retailers' profits are yet to be fixed. The mine price on hard coal is as follows:

White ash, broken, $4.55; egg, $4.45; stove, $4.70; chestnut, $4.80, and pea, $4.

Red ash, broken, $4.75; egg, $4.65; stove, $4.90; chestnut, $4.90 and pea, $4.10.

Lykens Valley, broken, $5; egg, $4.90; stove, $5.30; chestnut, $5.30, and pea, $4.35.

Jobbers will be allowed a maximum profit of 20 cents per ton of 2240 pounds for coal delivered at or east of Buffalo. For delivery west of Buffalo they will be allowed 30 cents. At Atlantic or lake ports jobbers may charge an additional 5 cents per ton if the coal has to be rescreened. These profits are also the limits of combined profits of two or more jobbers. The mine prices on soft coal run from $1.90 in Alabama (big seam) to $3.25 in Washington state for run of mine; $2.15 to $3.50 in the same districts for prepared sizes, and from $1.65 to $3 for slack or screenings. The prices for Pennsylvania, Ohio (thick vein) and West Virginia, excluding the New River district, are $2, $2.25 and $1.75 respectively. On bituminous coal, the President grants a profit of 15 cents per ton of 2000 pounds to any jobber or group of jobbers.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

WALTER A. JANSSEN, foundry superintendent, has severed a 10 years' connection with the Bettendorf Co., Davenport, Ia. A banquet in his honor was tendered him by his former employes and as an expression of their good will and esteem they presented him with a gold watch and diamond ring. Mr. Janssen is a director of the American Foundrymen's association and is chairman of its committee on steel foundry standards. His future affiliation has not yet been announced, but it is stated he will continue his work in a larger field.

C. Albert has been appointed manager of the Southwark Bronze Co., Philadelphia.

Howard C. Mull has been promoted from sales representative to sales agent in charge of the Chicago office of the Verona Tool Works.

Aurin Wood, superintendent of the Whitcomb-Blaisdell Machine Tool Co., Worcester, Mass., has resigned, effective Aug. 25. He plans to locate in another city.

Paul H. Gibbs, a mechanical engineer of the Ashcroft Mfg. Co., Bridgeport, Conn., has been commissioned a first lieutenant in the United States army.

William Maginness has been appointed manager of the Christiana Machine Co., Christiana, Pa. The capacity of this plant is to be extended by a new addition.

W. I. Vallentine, lately with the Chain Belt Co., Milwaukee, as superintendent, has resigned to take a position as vice president of the Advance-Rumely Co., La Porte, Ind.

F. C. Fish, formerly superintendent of the foundry of the Advance-Rumley Co., La Porte, Ind., has been appointed superintendent of the Marion Machine, Foundry & Supply Co., Marion, Ind.

Edwin T. Jackman of E. S. Jackman & Co., Chicago, Cleveland and Pittsburgh, agents for the Firth-Sterling Steel Co., McKeesport, Pa., has received an appointment as first lieutenant in the ordnance section of the officers' reserve corps, and now is on active duty.

Jarvis Williams Jr. has been made works manager and Lewis F. Hall assistant works manager of the U. M. C. plant of the Remington Arms-Union Metallic Cartridge Co., Bridgeport, Conn.

R. G. Taylor, of the American Car & Foundry Co., has been given a commission as captain of ordnance in the officers' reserve corps and has been assigned to duty at the Rock Island arsenal.

Dean McGrew Gilfillan, son of S. G. Gilfillan, president of the Belfont Iron Works Co., Ironton, O., has received a commission of captain of the coast artillery as the result of his training at Fort Benjamin Harrison, Ind., and Fortress Monroe, Va.

F. G. Schultz, formerly with the New York Central railroad, has accepted a position as assistant to Horton Penrose, Pittsburgh, manager of Shimer & Co., Philadelphia, producer of pig iron, ferromanganese and allied products.

William L. Allison, vice president of the American Arch Co., railway supplies, Chicago, has received a commission as major in the officers' reserve corps as a result of his training at the Fort Sheridan school of instruction.

Myron C. Summers, formerly assistant general sales manager of the Canton Sheet Steel Co., Canton, O., has been chosen sales manager of the De Forest Sheet & Tin Plate Co., Niles, O., succeeding C. H. Stewart.

Gilbert L. Robinson, formerly assistant manager of the steel department of Gaston, Williams & Wigmore, Inc., New York, has resigned to become associated with F. W. Highberger & Co., coal, coke, pig iron and steel, 30 Church street, New York.

Major Benedict Crowell of the Crowell, Lundoff, Little Co., Cleveland, general contractor, has been named by Secretary of War Baker as general purchasing agent of the war department for the Panama canal zone. Major Crowell, who recently was commissioned in the officers' reserve corps, succeeds Colonel Brown, who was relieved of his duties to take command of a national army regiment.

J. M. Barringer, formerly superintendent and sales manager of the American Malleables Co., Lancaster, N. Y., now is connected with the Timken-Detroit Axle Co., Canton, O., in the capacity of efficiency engineer.

J. P. Bennett, assistant superintendent of the West End branch of the Bethlehem Steel Co.'s Steelton, Pa., plant, has resigned and will leave shortly for Peoria, Ill., where he has taken a position with the Keystone Steel & Wire Co.

Dudley R. Kennedy, assistant to the president of the Youngstown Sheet & Tube Co., Youngstown, O., spoke at the annual convention of the International Association of Industrial Accident Boards and Commissions in Boston, Aug. 23.

Starling Burgess, James Imbrie and Frank H. Russell have resigned as directors of the Curtiss Aeroplane & Motors Corp., Buffalo, and have been succeeded by George C. Taylor, president of the American Express Co., Rodman Wanamaker and J. Kearsley Mitchell.

Carleton R. Dodge, recently of C. R. Dodge & Co., New York, has been named assistant sales manager for the Lakewood Engineering Co., Cleveland, in Philadelphia territory and has opened offices for the company in the Widener building, Philadelphia.

A. W. Ransome, who for nearly 20 years has been closely identified with the development and manufacture of concrete machinery, has joined with the Blaw-Knox Co., Pittsburgh, as manager and chief engineer of the company's newly established mixer department.

G. G. Reiss, formerly affiliated with the estate of P. D. Beckwith, Dowagiac, Mich., has been appointed superintendent of the new plant of the Minnesota Furnace Supply Co., at St.

Paul.. A new foundry recently has been built by this company for the production of castings for furnaces and heaters.

Judge James B. Kennedy, Youngstown, O., former judge of the Mahoning county common pleas bench and a member of the firm of Hine, Kennedy & Manchester, has been named chairman of the board of the Brier Hill Steel Co., Youngstown, succeeding Henry H. Stambaugh, resigned.

J. T. Mercer, formerly superintendent of the plant of the American Engineering Co., Philadelphia, has resigned to accept the position of works manager of the Deemer Steel Casting Co., New Castle, Del. William L. Fahnstock succeeds Mr. Mercer as superintendent of the American Engineering Co.

B. A. Shutts has resigned as superintendent of the Bird Coleman and North Cornwall furnaces of the Bethlehem Steel Co., Lebanon Pa., effective Sept. 1, to become superintendent of the Central Iron & Steel Co.'s blast furnace plant at Harrisburg. Mr. Shutts terminates a connection of 10 years. He will be succeeded by Ira C. Huber.

C. B. Dunster for a number of years consulting engineer with the Breitung mining interests and for the past three years manager of the mining department of Breitung & Co., New York, has succeeded H. L. Kaufman as manager of E. N. Breitung & Co., at Cleveland, and as assistant general manager of the Breitung iron properties. Mr. Kaufman resigned to enter the banking business in New York. H. B. Barling, formerly chief engineer under Mr. Dunster, succeeds him in New York. E. N. Breitung is general manager of both the iron operations from Cleveland and miscellaneous mining operations of Breitung & Co., New York.

Supplies Check Drilling

Director Van H. Manning of the bureau of mines, department of the interior, in a formal statement points out how the difficulty in obtaining adequate steel supplies seriously is interfering with the drilling of new wells and of the maintaining of oil production so essential in war. He says that the situation now in this respect is worse than at any time since the beginning of the European war. He says it is imperative that the oil well supply industry be placed on the favored list and be permitted to manufacture sufficient material for the oil producers in order that military and industrial needs for gasoline and other petroleum products may be assured. The bureau of mines has called the situation to the attention of the council of national defense. The bureau of mines also is pointing out to the oil producers how they may be conserving in the use of well materials.

Will Enlarge Output

The Wehr Steel Co., Milwaukee, is about to award contracts for the construction of additions which will increase the output of its plant from 300 to 400 tons of converter steel per month. The most important extensions consist of two 80-foot bays. At this time the company has not made a decision as to the new equipment that will be required, according to C. F. Wehr, superintendent. The erection work on the additions is in charge of the Northwestern Bridge & Iron Co., Milwaukee.

Will Market Products

The Valley Iron Co., Youngstown, O., chartered in Ohio with $200,000 capital, by Wade A. Taylor, C. H. Stewart, D. A. Strickland, F. L. Stewart and J. D. Blackburn, will deal in pig iron, billets, slabs, plates, sheets, tin plate and formed metal roofing products. In addition to the main office, which will be located in the Mahoning Bank building, Youngstown, the company will establish an office in New York, under the supervision of an official, yet to be named, who also will have charge of all export trade.

Needs Metallurgists

The national bureau of standards has not yet obtained all the men needed to fill metallurgical positions with salaries varying from $1200 to $2000 per year, depending upon the training and experience of the candidate. Men are desired with experience either in ferrous or nonferrous metallurgy. It is said that the duties in such positions will be almost entirely of an investigational nature in connection with problems of military importance.

Pushes Airplane Plant

The Curtiss Aeroplane & Motors Corp., Buffalo, is about to start the production of metal parts in its new plant although the construction work is not yet complete. It is thought that the plant will be operating at capacity by Oct. 15 instead of Jan. 1, as government officials had estimated. The expedition with which the buildings are being completed is due, in great part, to the efforts of W. A. Morgan, general manager, who is repeating the methods he so successfully used at the Buffalo Brass Works in turning out 15,000,000 brass parts for cartridge cases for England without a roof over the building. Auxiliary buildings to be added later will bring the total floor area of the Buffalo plant up to 1,400,000 square feet. The company has five additional plants in Buffalo and one in Hammondsport, N. Y. The Austin street plant, Buffalo, is to be devoted entirely to the manufacture of flying boats.

Will Manufacture Guns

The Wagner Electric Co., St. Louis, which just has completed a $12,000,000 order for 8-inch shells for the government, has signed a contract for 1000 four-inch guns, valued at $12,000,000, and for $3,000,000 worth of 8-inch shells. The Root & Vandervoort Engineering Co., East Moline, Ill., likewise has received an order for 1000 four-inch guns. These two concerns erected a special plant at East Moline, which is being operated as the R. & V. Wagner Ordnance Co.

Starts Foundry Course

In order to insure itself of a supply of trained foundrymen for responsible positions, the Westinghouse Electric & Mfg. Co. recently has established a course in foundry work for those of its employes between the ages of 17 and 21 years who have completed at least the eighth grade of public school or its equivalent.

The shop courses will include the following: Bench and floor molding; machine molding; coremaking; tempering of sand; cupola operation; mixing of alloys and cost calculating.

Classroom instructions will be given during the course in blue print reading, mechanical drawing, shop problems and metallurgy. Particular attention will be given to the alloys of iron and copper.

Builds Plant Addition

Rupert A. Nourse, vice president and general manager of the Stowell Co., South Milwaukee, Wis., founders and machinists, states that construction work now is in progress on a 2-story, 32 x 124-foot structure, one story of which is to be used for manufacturing purposes, the other story to be used as a shipping department. Practically all necessary equipment has been purchased.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

Price Fixing Keeps Finance in Doubt

PROPOSED government fixing of maximum prices for steel and other commodities is the principal topic of discussion in the financial markets. Movements of securities are being governed almost entirely by developments bearing upon this program. Stocks declined abruptly when the administration fixed bituminous coal prices at unexpectedly low levels, for Wall street regarded this action as an indication of what might be done in the cases of other materials. It marked down iron and steel shares generally, yet some of these shares were stocks of steel companies which might be expected to benefit from lower coal and consequently lower coke prices.

Wall Street is Dubious

Wall street is frankly dubious of the outcome of the price fixing program, feeling that the government has started something it may find impossible to finish to the best interests of the nation. Production of materials needed in war time on the broadest scale possible is felt to be the prime consideration. Fixing of prices is the cause of anxiety lest it deprive the investor of the incentive to risk his capital on the chance of a large return, at the time when increased production is needed. Wall street also is wondering what will become of the proposed mammoth war taxes if the suggested reduction in taxable income is effected. As iron and steel producers have contracted the larger portion of their output through the first half of next year, taxable incomes for this fiscal year would not be affected materially by government reductions in prices. But what would taxes the following year produce from profits fixed at a narrow margin? Still more important, what influence would drastic taxation, combined with fixed prices, exert upon the flotation of forthcoming war loans? In the long run it is the war loans which must be depended upon to furnish the sinews of war; this has been proved by Great Britain's experience during three years of war financing. Further, Wall street cannot perceive that any real purpose would be served by the suggested price fixing. As congress vigorously opposed abrogation of contracts, many months from now iron and steel producers will be making shipments at the present quoted market prices. Today, though pig iron is quoted $50 a ton and above, many furnaces are shipping on $18 and $20 contracts. If the government were now to fix a price on iron, six months from this date furnaces would be shipping $50 iron to customers covered with contracts on the one hand, and $35, $40 or $45 iron, according as the government might decide, to customers who have not covered their requirements. In other words, the government's action would have resulted only in discrimination against the consumer which had previously contracted. Even though the government should attempt the apparently impossible, deliveries of steel on existing contracts extend so far into the future that the influence of price fixing upon the cost of living of the general public would not be felt for possibly a year, perhaps not until after the conclusion of the war, when the readjustment would be automatic under natural conditions.

The following seems to be the consensus of opinion of many bankers, investors, manufacturers and business men generally—men of repute whose opinions are not dictated by their purses, but whose judgment is based upon their experience and upon the desire that the industrial organization of the country be utilized most efficiently to the successful conduct of the war: That it would be far better to let commerce follow its natural economic channels during the war; that interference with the present economic system will serve no useful purpose and may defeat the very end for which it is devised; that the course of prices should be determined by the natural law of supply and demand; that a wisely adjusted system of excess profit taxation on a graduated scale would distribute the burden of the war equitably without removing incentive; that the prices would be highest for those materials most needed in the conduct of the war, consequently checking extravagance among the public when economy is an urgent necessity; that the higher prices received for these necessary commodities would result in higher wages in such fields, thereby diverting labor to these fields; that while it may not be pleasant for the bookkeeper or the clerk to change his occupation to labor in a mill or munition plant, this is wartime and the country must have concentration of labor in essential lines; that it would be far better to effect this concentration by letting events follow their natural course than by possible industrial conscription, such as has been considered in England.

This summarized opinion is by no means held by every business man. Some are in full sympathy with the government's proposals; indeed, almost every business man has a theory of his own. But it is a composite expression of opinions by a number of business men, whose experience in practical affairs entitles them at least to this exposition.

Material Costs and Taxes Cut Locomotive Net

The effect of trebled war taxes in Canada and the United States, and the excessively high raw material and labor costs, are reflected in the annual report of the American Locomotive Co., New York, for the fiscal year ending June 30, 1917. Notwithstanding a gross business of $89,213,845 for the year compared to $59,316,016 in 1916 the company earned but $21.80 a share as against $36.08 for the fiscal year ending June 30, 1916. The company last year paid $2,205,318 taxes on profits compared to $795,000 in the previous year. The munitions business has been practically abandoned and the company is concentrating all of its energies on the manufacture of locomotives. Orders now on its books for such equipment

amount to $77,620,449. The munitions plants at Richmond and Montreal will be completed this month. The company has purchased the land and buildings of the Henrico Iron Works, Richmond, which will be used to make locomotive iron castings.

Sylvanus L. Schoonmaker, chairman of the board, in commenting on the year's business, says:

"During the year prices of materials of all kinds increased to an unprecedented degree; a great scarcity of skilled and unskilled labor existed, notwithstanding that large increases in wages were made, and the working time of the shops shortened. These abnormal operating conditions which could not be fully anticipated, affected the profits on both locomotives and munitions. Both in Canada and the United States, the selling prices on munitions were reduced to lower levels than prevailed in the preceding year, and new contracts for shells admitted, even under normal conditions, of a much smaller margin of profits than previous contracts allowed."

The comparative statement contained in the report covering three years follows:

	1917	1916	1915
Gross earn..	$82,213,845	$59,316,016	$9,303,298
Exp. dep. etc.	72,614,654	47,450,582	10 445,900
Interest	192,192	301,005	349,379
Taxes†	2,205,319	795,000	.....
Profit	$7,201,680	$10,769,429	$$1,491,980
Prfd. divs...	1,750,000	1,750,000	1,750,000
Balance ..	*$5,451,680	$9,019,429	$$3,241,980
Com. divs...	‡1,500,000	.....	.....
Add and bet..	2,000,000	3,000,000	.....
Surplus ..	$1,951,680	$6,019,429	$$3,241,980

*Equivalent to $21.80 a share earned on $25,000,000 common stock, compared with $36.08 a share earned in the previous year.

†United States and Canadian taxes on profits.

‡Includes $250,000 special Red Cross dividend of 1 per cent.

$Deficit.

Will Reopen Plant

The plant of the Hopkins & Allen Arms Co., Norwich, Conn., which has been closed two months because of the lack of funds and is in the hands of receivers, is to be reopened in about a month to complete the Belgian contract for 150,000 rifles, 11,000 of which had been made when it shut down. The money will be furnished by the Belgian government, which has received a loan of $2,500,000 from the United States government. Twenty-five toolmakers have been engaged to start working for the company.

Takes Site For Plant

The Standard Steel Castings Co., Cleveland, which recently increased its capital to $1,000,000 and announced its intention to build a new plant, has purchased a 20-acre site for this purpose. The new plant, which is to be used for the production of cast steel wheels for motor trucks, will consist of three buildings and will involve the expenditure of about $300,000. Plans for the new plant are being drawn by the Osborn Engineering Co., Cleveland.

Financial Crop Ends

Sales of the Vulcan Detinning Co., Sewarren, N. J., totaled $514,861 for the six months ended June 30. The net profits for the period was $85,296.

* * *

A stock dividend of 100 per cent has been declared by directors of the Toledo Machine & Tool Co., Toledo, O. The company is capitalized at $3,000,000 and has $1,200,000 outstanding.

* * *

A net operating income of $303,127 for July is shown in a report of the Gulf States Steel Co., Birmingham, Ala. This is an increase over the preceding month of $90,330.

* * *

Estimates place the operating profits of the Advance-Rumely Co., La Porte, Ind., for the first seven months of 1917 as 30 per cent greater than during the same period of last year.

* * *

The plant of the Nazareth Foundry & Machine Co., founded in 1903 by the late Conrad Miller, and which has been held to a certain extent ever since by the Miller interests, has been sold to New York parties, for a consideration of about $100,000.

* * *

The Emergency Fleet Corp. has filed a mortgage of $2,505,000 on the property of the Downey Shipbuilding Corp., which comprises the plant recently taken over by this company from Millikin Bros., Staten Island. The mortgage was executed in order to provide funds for the conversion of this plant into a shipyard.

* * *

A meeting of the stockholders of the Boston Belting Co. has been called for Sept. 14 to act on the recommendation of the directors that they sell the assets of the company to Willett, Sears & Co., of the same city at a net price equivalent to $132.50 a share. Of this $82.50 is to be paid in cash and $50 in preferred stock of a new Boston Belting Corp., to be incorporated under the laws of Massachusetts, with $500,000 capital.

Building Large Furnaces

The Bethlehem Steel Co. is building two new 200-ton open-hearth tilting furnaces at its Saucon plant. These will materially increase the steel output of this plant which at the present time is derived from 16 basic stationary open-hearth furnaces and from two 20-tons converters.

Large Sale

Of Canadian Toluol is Made—Government Figuring on Huge Quantity

New York, Aug. 28.—The largest single transaction in toluol of several months included in the week's business. It involved fully 100,000 gallons for spot delivery. The material was from Curtis & Harvey, Ltd., whose plant at Montreal was destroyed by fire Aug. 18 with a loss of some 500 tons of toluol. It was loaded on cars which escaped the flames. This business it is understood was closed between $1.60 and $1.70 a gallon.

Both the United States and French governments are in the market for huge quantities of trinitrotoluol, which will require approximately 100,000 to 125,000 gallons of toluol per month.

Coke Oven By-Products

Spot.

Per Gallon at Producers Plant.

Pure benzol	$0.50 to .55
Toluol	1.75 to 2.00
Solvent naphtha	.18 to .20

Per Pound at Producers Plant.

Phenol	$0.40 to .42

Per 100 Pounds at Seaboard.

Sulphate of ammonia	$4.85 to 5.00

Contract.

Per Gallon at Producers Plant.

Pure benzol	$0.50
Toluol	1.50 to 1.80
Solvent naphtha	.18 to .20

Per Pound at Producers Plant

Phenol (nominal)	$0.40 to .42

Per 100 Pounds at Seaboard.

Sulphate of ammonia	nominal

Inasmuch as the major portion of the output in this country is sold ahead to next spring, it is believed that the contracts, when they are let, will involve deliveries to begin about that time. Toluol for the United States will be furnished at $1.50 a gallon at producers' plants, the price recently agreed upon between the government and producers. It is doubtful, however, whether foreign requirements will be placed at this figure. Fair quantities recently were contracted for by chemical manufacturers for delivery this year at approximately $1.75 to $1.80 per gallon.

Fair quantities of contract benzol have been sold recently as high as 53 cents per gallon for the third and fourth quarters. Contract now may be quoted at about 50 cents. Spot ranges between 50 and 55 cents per gallon. Phenol is in fair demand. Solvent naptha prices are inclining lower. Spot and contract are quoted at 18 to 20 cents per gallon.

Gunmakers' Requirements Heavy

Many Private Plants Working on Government Contracts Buy Extensively While Others Plan to Enter Market at Early Date—Cranes Bought Freely by Shipyards—New List Out in Cleveland

WITH THE progress of war preparations, the government's equipment requirements are assuming ever-increasing prominence in the machinery markets. Several builders will be devoting practically their entire plants to direct and indirect government work for more than a year to come. Decision as to priorities of delivery rests with Washington. This is a matter which has not yet been fully systematized. Frequently several departments may desire the same machine simultaneously for what each considers extremely essential work. The trouble is that there is no one official having authority to decide what work is the most necessary. As pointed out previously by THE IRON TRADE REVIEW, the appointment of some government official to decide what work should receive preferred deliveries would eliminate much confusion and would save time.

Tools Being Bought for U. S. Shops in France

Attention has been given the past week to the establishment of two government shops in France, one of these being a railroad shop in conjunction with the American railroad in France; the other shop is to be for ordnance repair and similar work. All the material required in the construction of these plants is to be brought from the United States. It is planned to have the railroad shop operating by Dec. 1, and deliveries of equipment now being purchased are to begin in 60 days. The Pennsylvania railroad's purchasing department has issued inquiries in behalf of the government. S. M. Felton, director general of railroads, at Washington, is awarding contracts. Orders are being distributed for 18 cranes, including four 65-ton, two 30-ton and 12 5-ton. In this connection a statement has been made by the Cleveland Crane & Engineering Co., Wickliffe, O., as follows: "The United States Government, through the Pennsylvania railroad, has been able to place the order for 18 cranes for the new railroad shops in France. The Cleveland Crane & Engineering Co. will complete this contract in approximately 90 days, making shipment of the first crane Sept. 15, or 25 days after receipt of order. Several of the cranes being of 65 tons capacity and 80-foot span." It is believed other orders will follow. Negotiations for hammers and bending rolls now are under way. The list on the gun ship equipment has not yet been issued.

Labor trouble is handicapping production of some plants, but work is being pushed on the government's destroyer, ordnance, cargo-ship building, aeroplane and munition programs. Among the companies which are to machine gun forgings in this district are the American Brake Shoe & Foundry Co., Erie plant, which has purchased about all the equipment it needs to machine 6-inch howitzers; the Bullard Machine Tool Co., Bridgeport, Conn., which has closed for its requirements excepting one large special slotting machine; the American Radiator Co., Bayonne, N. J., plant, which has a contract for 3-inch and 4-inch guns and has just distributed orders for slab and open-side milling machines, heavy lathes and rifle drilling machines for the 3-inch guns and is yet to close for machinery for the 4-inch guns.

While the government has not yet signed contracts with the various interests which are planning large new shipyards, such action is expected shortly. The American International Corp., which plans to construct a yard of 50 ways at Hog Island, will start actual work as soon as the contract is signed. It has issued a list of machines, worth probably $1,000,000 and has already taken tenders on much of this equipment. The Federal Shipbuilding Co., newly organized subsidiary of the United States Steel Corp., also is buying equipment, having just closed for boiler and plate shop machinery. It will issue a crane list shortly. The Merchant's Shipbuilding Co., affiliated with the Chester Shipbuilding Co., both with headquarters in the Finance building, Philadelphia, has changed specifications on its inquiry for 24 cranes, now seeking double-trolley 15-ton traveling cranes. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, is in the market for two 5-ton electric traveling cranes. The Groton Iron Works, New London, Conn., has not yet closed for the five ship cranes, including one 5-ton, three 10-ton and one 20-ton, for which it recently inquired. The Hay Foundry & Iron Works, Newark, N. J., which was inquiring for 10 5-ton cranes has not yet closed. The Southern Pacific railroad is inquiring for one 35-ton crane and is reported to be asking for two 100-ton cranes. The Bethlehem Steel Co. is inquiring for one 15-ton overhead crane. The Staten Island Shipbuilding Co., S. I., New York, is inquiring for two 50-ton four-motor cranes for its machine shop.

Airplane Builders Plan to Buy Heavily

Orders for tools, said to approximate $1,000,000, have been distributed for the new Buffalo plant of the Curtiss Aeroplane & Motors Corp. The Simplex Automobile Co., New Brunswick, N. J., controlled by the Wright-Martin Air Craft Corp., which recently issued a list of about 100 tools, is expected to issue another similar list soon. The Remington Arms & Ammunition Co., Bridgeport, Conn., is figuring on equipment and may issue a list of turret lathes, drills, presses, etc., shortly. The Northeast Electric Co., Rochester, N. Y., is asking for information on lathes and screw machines.

Several individual inquiries for plate working machinery for export to Japan are in the market; a few contracts have been closed. Little Russian business is being done at present, owing to difficulty in obtaining bottoms. Russia has considerable equipment in storage in the United States and still more at its ports of Archangel and Vladivostok. Charles A. Hass, 50 East Forty-second street, New York City, has issued an inquiry for plate-making machinery for a shop in

AGATHON

ALLOY STEELS

Top, before the test,
Bottom, after

This Crankshaft was forged by

The Anderson Forging & Machine Company
Detroit, Michigan

from "AGATHON" TYPE AA CHROME VANADIUM and the material was cold when the test was made.

By consistently putting out alloy steels which will meet any test they may be subjected to, we have in record time achieved a reputation second to none among the alloy steel manufacturers of the world.

Our brand name "AGATHON"—the term bestowed by the classic Grecians upon achievements of superlative quality, is your assurance of the highest possible quality in alloy steels.

"AGATHON" Steels will serve YOUR purpose best

The Central Steel Company
Massillon, Ohio

AGATHON STEELS

"AGATHON" Chrome Nickel
"AGATHON" Chrome Vanadium
"AGATHON" Nickel Steels
"AGATHON" Special Analyses
"AGATHON" Vanadium
"AGATHON" Chrome Steel
"AGATHON" High Carbon

Branch Offices:
Detroit Office: 326-27-28 Ford Building, F. Walter Guibert, District Representative.
Cleveland Office: Hickox Building, The Hamill-Hickox Company, District Representatives.
Chicago Office: 1370 Peoples Gas Bldg., 112 South Michigan Blvd., A. Schaeffer, District Sales Manager.
Philadelphia Office: 902 Widener Building, Frank Wallace, District Sales Manager.
J. E. Dockendorff & Co., 20 Broad Street, New York, General Exports Agent.

Say you saw it in THE IRON TRADE REVIEW

France, to fabricate steel dump cars. The list consists of about 40 machines, including punches and shears, drills and plate-bending equipment.

Chicago Buying Continues at Fair Rate

AN ABSENCE of large inquiries features the machine tool market in Chicago. Aside from the requirements of the A. O. Smith Co., Milwaukee, which have not been closed, inquiries are mostly for one to three tools. The demand continues to be for heavy equipment, although some business is still being done in lighter tools. The vacation season seems to be having its effect on business and at present sales are few, although shipments on previous orders are being forwarded in large volume. In spite of the apparent slackening, most dealers find August is presenting a fair amount of business. Recent sales of gear cutters, milling machines, and radial drills, on which deliveries run well into next year, show that buyers feel that the market will not change materially. Some miscellaneous business has been taken recently for the Rock Island arsenal and ordnance makers in that city have also been completing their equipment by adding a few small tools. The Hughes Tool Co., Houston, Tex., is building a plant. The Llewellyn Iron Works at Los Angeles is preparing to erect an assembling plant on the waterfront to care for its marine business. The Emerson-Brantingham Co. is building a machine shop in connection with its plant at Minneapolis. The Slaymaker Electric Welding Co., Detroit, will build a plant for the manufacture of welding machinery. The Lake Shore Engine Works, Marquette, Mich., is building an addition to its machine shop and the Hess Pontiac Spring & Axle Co., Pontiac, Mich., is building an addition to its plant.

Heavy Tools Inquired for in Cleveland

INQUIRIES appearing in the Cleveland machine tool market have for some time past called for a miscellaneous line of shop equipment with milling machines foremost in demand. This condition suddenly has switched to an insistent call for boring mills. "Boring mills", states one local dealer, "are harder to get than ever. We could sell 10 machines for spot cash tomorrow if we could lay our hands on the tools." Deliveries on new machines of this type are quoted from six to 18 months. Used boring mills are scarce and command a premium almost equal to the new price when they appear on the market.

Following its recent increase in capital stock to $1,000,000, the Standard Steel Castings Co., Cleveland, has purchased a 20-acre plot and expects to erect an additional plant. It is stated that this plant will be devoted exclusively to the production of cast steel truck wheels for government war trucks. The new plant will be comprised of four units. J. F. Janes is president of the company. Local dealers believe that a large amount of machine tool equipment will be purchased by this company.

The Heppenstall Forge & Knife Co., Pittsburgh, is in the market for gun-making machinery. This equipment will include heavy gun-boring lathes. Babcock & Wilcox, Barberton, O., are in the market for a No. 3 type universal milling machine. The American Clay Machinery Co., Bucyrus, O., is in the market for a new or used slab milling machine, 60 inches wide, 48 inches high, with 8-foot or 10-foot table. V. M. Virtue is purchasing agent for the American Clay Products Co.

A good list of machine tools has been issued by the Gaylord-Feaga Co., Citizens building, Cleveland. The requirements of this company appear in detail on page 466. The United States Tool Co., Cleveland, has filed plans for a factory building to be erected on a site which it recently purchased at 3140 West 106th street, Cleveland. The structure will be brick, one story, and will cost about $25,000. The Minnick-Gibbons Co. is the general contractor. The Peters Machine & Mfg. Co., 7320 Madison avenue, Cleveland, has purchased a parcel of land at the rear of its present plant and it is said that an additional building will be erected shortly. The Economy Machine Co., Cleveland, has been incorporated with $25,000 capital stock by Abraham Gradis and David Krause.

Some Pittsburgh Dealers Busy

EXPANSION of plants for the production of munitions for the government continues to throw a heavy volume of business to manufacturers of machinery and machine tools in the Pittsburgh district. It is understood to be the policy of the government to aid in financing these expansions where they will be of no use to the private producer after peace has been established. Apparently, it is the intention that such units will be dismantled when no longer needed and equipment either thrown back on the market for sale, or turned over to the government. Purchases of machine tools by private interests are somewhat more brisk this week than they were last week. One manufacturer reports that he has closed contracts for a number of cranes, which were bought despite the high prices that had to be paid and the extended periods of delivery provided. Other manufacturers, however, report that business continues to be dull and are inclined to think it will not become active until the present unsettled state of trade conditions has come to an end.

Among New England Factories

KITTERY, ME.—L. H. Shattuck, Inc., has been incorporated to build steamships with $600,000 capital by F. W. Hartford, Randolph W. Branch, and Horace Mitchell.

PORTLAND, ME. — The American Zinc Co. of Arkansas has been incorporated to do general mining, milling and smelting with $10,000 capital by P. E. Coyle, W. H. Coolidge Jr., treasurer and H. P. Sweetser.

BOSTON.—Carl Stohn has let the contract for a brick, mill construction, 2-story, 42 x 110-foot factory on Bradley street, Hyde Park district.

BOSTON.—The American Whaley Engine Co. has been incorporated with $1,000,000 capital by T. S. Spinney, G. C. Coit, and H. A. Stebbins.

BOSTON.—The H_2O Sales Co. has been incorporated to make carbon eliminators for internal combustion engines with $100,000 capital by Jerome J. Pratt, William H. Hastings and A. D. Fraser.

BOSTON.—The Sturtevant Motor Co. has been incorporated with $20,000 capital by W. L. Sturtevant, Harold T. Sturtevant, and T. F. O'Brien.

CLINTON, MASS. — The Roubaix Mill, Inc., will build a brick, 1-story, 65 x 200-foot addition for a power house.

CLINTON, MASS. — The Clinton Wire

A Note From

ROLLING MILL JIM

Don't
Say
Rolls—
Say
HUBBARD
So long—

Rolling Mill Jim.—

Hubbard Steel Foundry Co.
EAST CHICAGO, IND.
All Kinds of Iron and Steel Rolls and Steel Castings.

Say you saw it in THE IRON TRADE REVIEW

Cloth Co. will build a brick, reinforced concrete, 1-story, 58 x 110-foot annealing shop at Parker and Sterling streets.

EVERETT, MASS.—Fellows & Co., Boston, are building a 3-story, 40 x 80-foot factory on River street.

ERVING, MASS.—The Heywood Bros. & Wakefield Co. has let the contract for rebuilding its plant which was recently damaged by fire.

HOLYOKE, MASS. — The Worthington Pump & Machinery Corp. will build a brick and steel, 1-story, 100 x 150-foot addition to its machine and erecting shop at the Deane works.

NEW BEDFORD, MASS. — Bids have closed for a brick, mill construction, 4-story, 59 x 321-foot addition to the mill of the National Spun Silk Co., Purchase street, to cost $160,000.

WELLESLEY, MASS. — The Macdonald Mfg. Co. has been incorporated to make vehicle bodies and tops with $50,000 capital by John A. Singler, John V. Macdonald and Fred Platts.

WORCESTER, MASS.—Fire damaged the plant of the Lombard Machine Co., Stafford street, Aug. 12, to the extent of about $15,000.

FAIR HAVEN, CONN. — The American Steel & Wire Co. has let contracts for a brick and concrete, 1-story, 88 x 363-foot rope mill, a brick, 1-story, 60 x 223-foot addition to building No. 7 and a brick, 1-story, 50 x 125-foot addition to Building No. 31.

NEW HAVEN, CONN.—C. W. Blakeslee & Sons Co. has been awarded a contract by the city to erect a tide gate dam on Mill river for $68,000.

SOUTHINGTON, CONN. — The Clark Bros. Bolt & Nut Co. has let the contract for a brick addition to its plant in Milldale.

Along the Middle Atlantic Seaboard

BROOKLYN, N. Y. — The Gem Metal Products Corp. has been incorporated with $10,000 capital to manufacture metalware by E. Bobker, M. and I. Kleinfeld, 188 Hinsdale street.

BUFFALO.—The Transcontinental Motors Truck Corp. has been incorporated with $1,250,000 to make trucks, engines, motor boats, etc. The incorporators are: E. S. Stengel, R. A. Schmidt and P. J. Bloxham.

FULTON, N. Y.—The Arrowhead Mills, Inc., have had plans prepared for a 2-story paper mill 80 x 350 feet, to cost about $350,000.

NEW YORK.—The Chino Del Norte Copper Co. has been chartered in Delaware with $3,000,000 capital by J. V. Reilly, J. A. Moore and S. B. Howard.

NEW YORK.—The M. H. Keyless Lock Co. has been incorporated with $10,000 capital to manufacture locks by J. Mainzer, I Heinz and R. Applebome, 224 Fifth street.

NEW YORK. — The Amsell Construction Co. has been incorporated with $10,000 capital to engage in a business as engineer and contractor by J. S. and M. and C. S. Amsell, 27 Stuyvesant avenue.

NEW YORK.—The Ramapo Ore Co. has been chartered with $10,000 capital to engage in the mining of ore, coal and minerals. The incorporators are: F. D. Stoba, A. J. Gathercoal and A. E. Moore, 37 Wall street.

NEW YORK. — The Safety Machinery Corp. has been chartered with $150,000 capital to manufacture light machinery. The incorporators are: J. J. Axilrod, H. and H. Frankel, 318 East Thirty-second street.

NEW YORK.—The Nemetco Products Co., capitalized at $10,000, has been chartered to manufacture metal and electrical supplies by M. Levin, M. Halperin and I. Krainess, 88 Walker street.

NEW YORK.—The Kar Engineering Co. has been incorporated with $125,000 capital to manufacture machinery and tools. G. P. Robbins, M. and S. Karasick, 129 East Eighty-second street are the incorporators.

NEW YORK. — The Emergency Construction & Equipment Co. has been incorporated with $50,000 capital to build dry docks, shipyards, etc., by A. N. Sohmer, H. Gerson, L. L. Meyers, 29 Broadway.

NEW YORK.—The Tacony Ordnance Co. has been incorporated to manufacture firearms and ordnance with $100,000 capital by J. B. Warren, W. C. Pearson and O. W. Bird, Hempstead, L. I.

NEW YORK.—The Charles T. Gullette Motors Corp. recently was chartered with a capital of $50,000 for the purpose of engaging in the manufacture of automobiles and accessories. L. H. Siebel, C. T. and E. T. Gullette, 421 West 119th street, are the incorporators.

NEW YORK.—The United States Airplane & Engine Co. has been chartered in Delaware with $1,000,000 capital to manufacture automobiles, engines and airplanes by S. B. Howard, L. H. Gunther and J. A. Moore.

NEW YORK.—The Masters Metals Co. has been incorporated in Delaware with $100,000 capital to buy, sell and deal in metals of all kinds. The incorporators are: S. B. Howard, L. H. Gunther and G. J. Reily.

NEW YORK. — The Brunswick Dredging Co. has been chartered with $50,000 capital for the purpose of engaging in dredging and construction work by D. S. Stein, H. Gerson, and L. L. Meyers, 29 Broadway.

NEW YORK.—The Illuminal Corp., capitalized at $10,000, has been organized to manufacture gas, electric and other lighting fixtures by S. Werchansky, R. E. Berthold and G. Suss, 111 Broadway.

NEW YORK. — The Nitrogen Fixation Corp., capitalized at $1,000,000 has been organized to engage in the manufacture of chemicals and compounds by J. A. Comstedt, J. R. Rubin and S. R. Weil, 34 Pine street.

NEW YORK.—The United Steel & Metal Corp. has been incorporated with $100,000 to engage in the manufacture of iron steel and other metal products. A. Heller, F. Viethardt and M. Sternberg, 906 Broadway, are the incorporators.

NEW YORK. — The Sheffield Iron Corp. has been chartered with $777,500 capital to manufacture and deal in steel, iron and other metals. The incorporators are: J. Gayley, J. R. Floyd and H. K. Wood, 65 Cedar street.

EAST PITTSBURGH, PA. — The Watts Tool & Machine Co. has been incorporated with $100,000 capital to carry on a business as machinist. C. J. Watts, Turtle Creek, and others are the incorporators.

NEW EAGLE, PA.—The Denite Steel Co. has been incorporated with $100,000 capital by B. A. Davis and others.

PHILADELPHIA. — Bids are being taken on a machine shop addition to be erected for the Midvale Steel Co.

PITTSBURGH. — The Pittsburgh Mining Machine Co. has been chartered with a capital of $100,000 to manufacture mining machinery by T. H. Edelblute and others.

PHILADELPHIA.—The Machine Composition Co. has been organized with a capital of $18,000 for the purpose of engaging in the manufacturing of printing type. B. F. Banes and others are the incorporators.

PHILADELPHIA.—The Gorgas-Pierie Mfg. Co., 130 East Allen street, has let the general contract to the Turner Concrete Steel Co. for a 5-story, 75 x 155-foot building to cost about $100,000.

PHILADELPHIA.—Charles Lennig & Co., 112 South Front street, contemplate the erection of a 2-story, 40 x 50-foot addition to their chemical plant at Richmond street and Delaware avenue. The estimated cost of the building is $11,000.

WILLIAMSPORT, PA. — The Lycoming Foundry & Machine Co. has received an order for castings for the Dort Automobile Co. and it is expected that the capacity of the Lycoming plant will be increased and additional buildings may be erected.

ASBURY PARK, N. J.—The city commission will expend $11,400 to rebuild the power plant.

LAKE DENMARK, N. J.—The government will receive bids on Aug. 27 for a 2-story, 50 x 150-foot, magazine storehouse and also one of similar size at Fort Mifflin, Pa.

LINCOLN, N. J.—The Lincoln Chemical Works has been chartered to manufacture chemicals with $10,000 capital stock. N. S. Kallmann, Hyman Beler and Morris Katz, Brooklyn, are the incorporators.

LYNDHURST, N. J. — The Lackawanna railroad will erect a new station to cost $30,000.

MANASQUAN, N. J.—The Mackay Mfg.

Many Tools Needed

The following list of machine tools has been issued by the Gaylord-Feaga Co., Citizens building, Cleveland:

One 16-inch x 6-foot toolmaker's lathe,
One 36-inch x 14-foot gap lathe,
One 48-inch radial drill,
One 24-inch radial drill,
One 24-inch shaper,
Five 14-inch radial wheel stands,
One 1100-pound steam hammer,
One 125-pound trip hammer,
One 1½-inch to 2-inch pipe machine,
One 2-inch to 8-inch pipe machine,
One 20-inch drill press,
One 24-inch drill press,
One 14-inch x 6-foot tool room lathe,
Three 16-inch gap punches,
Five 60-inch gap punches,
One 48-inch gap punch,
Two horizontal punches with capacities from 10 inches to 16 inches,
Two 48-inch gap shears,
One beam shear with a capacity up to 20 inches,
One 50-inch plate planer,
One coping machine,
Three 15-foot radial countersinking machines,
One 20-inch cold press,
One 2½-inch automobile bolt cutter.

Co. contemplates installing machinery in the plant of old New Jersey Bridge Co. for the manufacture of heating appliances.

NEWARK, N. J.—The W. A. K. Motor Co. has been chartered with $50,000 capital to deal in motors, engines, etc., by W. Lyons, V. P. Kreischmer and others.

NEWARK, N. J.—The New Process Pipe & Tube Bending Co. has been chartered with $10,000 capital to deal in tubing, etc. The incorporators are: A. Frohlick, C. Frohlich and H. Kistner.

PASSAIC, N. J.—The New York Belting & Packing Co. will erect a 5-story, 87 x 250-foot brick and reinforced concrete factory.

PERTH AMBOY, N. J. — The Convery Coal Co. has been chartered with $100,000 capital to deal in coal, coke, etc., by C. P. Convery, Patrick Convery and Henry Conard.

PERTH AMBOY, N. J. — The Bruner Chemical Co. has been chartered with $100,000 capital to manufacture chemicals. The incorporators are: Willard L. Bruner, L. S. Bruner, and J. Norman Bruner, Philadelphia.

TRENTON, N. J.—The International Fibre Co. has been chartered to engage in the manufacture of fibre soles and rubber goods. The incorporators are: Peter E. Wurfflein, William Keegan and LeRoy W. Skelton.

DOVER, DEL. — The Universal Minerals Separation Co. has been chartered with $250,000 capital to purchase, own and operate mines, mining properties, materials, mills and machinery.

WILMINGTON, DEL.—The Mirafir Metal Co., capitalized at $500,000, has been organized to mine, extract and prepare for market ores, minerals, iron, etc.

WILMINGTON, DEL.—The Treen Motors, Inc., has been incorporated with $1,000,000 capital to manufacture engines by F. D. Buck, M. L. Horty and M. H. Noblit.

WILMINGTON, DEL. — The Stubner Chemical Works has been incorporated with $100,000 capital to manufacture, buy, sell and deal in and with alkalies, alkaline products, dyes and chemicals.

WILMINGTON, DEL. — The American Barium Corp. has been incorporated with $100,000 capital to mine, mill and refine barytes and other minerals and to manufacture and deal in and with their by-products.

WILMINGTON, DEL.—The Fulton Commerce Corp., capitalized at $500,000, has been chartered for the purpose of building boats of all kinds by L. A. Irwin, M. L. Rogers, and M. L. Gatchell.

WILMINGTON, DEL.—The John Cuthbert Co. has been incorporated to carry on a business as electrical engineer with a capital of $500,000. The incorporators are M. M. Clancy, C. L. Rimlinger, and C. M. Egner, Elkton, Md.

WILMINGTON, DEL.—The Pusey & Jones Co. has been granted permits for building extensions to cost about $70,000. The new structures will include a 3-story, 40 x 60-foot, tool house, a 2-story, 60 x 100-foot machine shop and a 2-story addition to the mold loft.

WILMINGTON, DEL. — The Iron Ore Products Co. has been organized with $2,000,000 capital to mine, extract, refine and deal in ores and mineral products of all kinds. C. L. Rimlinger, F. A. Armistrong and C. M. Egner, Elkton, Md., are the incorporators.

BALTIMORE. — The Metal Springs & Welding Co., chartered with $75,000 capital, will engage in the production of metal springs and other similar products.

Activities in the Central States

ADELL, WIS.—P. H. Slattery, Adell, Wis., has engaged Architect Clare C. Hosmer, Milwaukee, to prepare plans for a $12,000 garage and service building, 60 x 125 feet, to be one story high.

CUDAHY, WIS.—The Federal Rubber Co. has awarded contracts to the Leonard Construction Co., Chicago, for the erection of a 6-story brick and steel factory addition, 45 x 300 feet, of brick and steel, and an office building addition, 56 x 133 feet, two stories and basement.

MANITOWOC, WIS. — The Dicke Motor Car Co. has purchased buildings adjoining its present garage and will build a 2-story fireproof addition, 40 x 120 feet, for repair and storage purposes.

MILWAUKEE.—A $45,000 garage and repair shop building, 75 x 150 feet, will be erected on Grane avenue, near Seventh street, by the Welch Investment Co., Germania building. H. C. Hengels is architect.

MILWAUKEE.—C. B. Danielson, 638 Mineral street, has taken the contract for erecting a 1-story warehouse, 112 x 218 feet, for Joseph Benesch & Co., scrap iron and junk dealers, 1718 Vliet street, at South Pierce street and Western avenue.

SHAWANO, WIS.—A $25,000 public garage and machine shop will be erected by the Schweers Hardware Co. Plans are being prepared by Architect C. F. Zietlow for an L-shaped, 2-story building, 70 x 102 and 40 x 70 feet.

SHAWANO, WIS.—D. E. Westcott, city clerk, is taking bids until Sept. 7 for the construction of additions and extensions to the electric light and water power plants of the city. B. Royer is president of the public utilities commission.

STEVENS POINT, WIS. — A steel and concrete addition, 75 x 150 feet, will be erected to the paper and pulp mills of the Wisconsin River Paper & Pulp Co., Neenah, Wis. The investment will be about $100,000. Charles A. Babcock, Neenah, is president.

SUPERIOR. — Articles of incorporation have been filed in behalf of the Automatic Machine Co., capital stock, $25,000. The incorporators are Erick G. Hoglund, Fred Henderson and Gustaf Engelbrekt.

TWO RIVERS, WIS.—The Dicke Motor Car Co. is contemplating the erection of a new public garage and machine shop, 65 x 140 feet, two stories and basement at a cost of $25,000. W. C. Dicke is general manager.

BENTON HARBOR, MICH.—The Benton Harbor Auto Machine Co. has been incorporated to manufacture machinery and auto parts with an authorized capital of $174,000.

DETROIT. — The Walker Universal Joint Co. has been chartered with $350,000 capital to manufacture auto and machinery parts by George E. Walker, Adelbert H. Lindley and H. A. Hathaway.

DETROIT.—The Slaymaker Electric Welding Co., 686 West Grand boulevard, has been incorporated with $280,000 capital to build a plant to manufacture welding machinery.

DETROIT. — The Parker Mfg. Co. has been incorporated with $75,000 capital by G. C. Parker and H. K. Chambers, 365 Seward street. It will manufacture machine products.

JACKSON, MICH.—Bids will be received until Aug. 29 by A. W. D. Hall, city manager, for a steam driven vertical centrifugal pump, electric driven deep well pumps and two electrically driven horizontal centrifugal pumps.

MARQUETTE, MICH.—The Lake Shore Engine Works, East Crescent street, is building a 1-story addition to its machine shop to cost $12,000.

MUSKINGUM, MICH. — The Enterprise Brass Works, Frank Holt, president, has completed plans for a 50 x 100-foot foundry building.

PONTIAC, MICH. — The Hess Pontiac Spring & Axle Co., Branch street, will build an addition costing $15,000. F. F. Crimmelsman is superintendent.

SAGINAW, MICH.—The Saginaw Malleable Iron Co. has been incorporated to manufacture metal goods, metal wares, etc., with $350,000 capital.

CHICAGO.—The Western Pipe & Supply Co. has been chartered with $5000 capital to buy and sell pipe, tanks and factory supplies.

CHICAGO.—The Economic Electric Devices Co. has been organized with $20,000 capital by Jacob Bunn, Robert C. Lamphier and Alonzo Huff.

CHICAGO.—The Anchor Car Co. has been incorporated with $80,000 capital by C. E. Kremer, 175 West Jackson boulevard, S. W. Prime, and T. L. Osborn.

CHICAGO. — The Commercial Bike Mfg. Co. has been incorporated with $25,000 capital by Isabel Dullaghan, Samuel Horwitz, and Nathan Himelfarb, 2429 West Adams street.

CHICAGO.—The Champion Metal Co. has been incorporated with $1000 capital by W. C. Mason, Thomas Lundberg, and Stanley Rich, 38 South Dearborn street.

Government Inquiries

The Navy Department, Bureau of Supplies and Accounts, Washington, D. C., is in the market for the following machine tools:

Miscellaneous number of solid, straight shank, high-speed steel counterbores, 1432, no date, Washington.
Miscellaneous number of drill and countersinks, 1432, no date, Washington.
One 3-foot, motor-driven plain radial drill, 1433, no date, Philadelphia.
Two 16-inch, motor-driven buffing machines, 1433, no date, Philadelphia.
Twelve 24-inch geared-head engine lathes, 1423, Sept. 4, Norfolk, Va.
One motor-driven 4-spindle, drill press, 1433, no date, Philadelphia.
Miscellaneous number of 60-inch center reamers, 1432, no date, Washington.
Miscellaneous number of metal-slitting steel saws, 1432, no date, Washington.

Schedule numbers and place of delivery follow the specifications of the tools. Further information may be had on application from the Navy Department, Bureau of Supplies and Accounts.

Iron and Steel Prices

Corrected to Tuesday noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports.	
Old range Bessemer, 55 iron	5.95
Mesabi Bessemer, 55 iron	5.70
Old range non-Bess., 51½ iron	5.20
Mesabi non-Bess., 51½ iron	5.05
Port Henry Ores, non-Bessemer, Per Unit,	
Delivered Eastern Pennsylvania.	
Old Bed, crude 55 iron	10.50c to 11.00c
Old Bed., concent., 65 iron	11.00c to 11.50c
Harmony, concent., 63 iron	11.50c to 11.75c
Lump (at mines)	$5.75

WAREHOUSE PRICES

Steel bars, Chicago	4.50c
Steel bars, Cleveland	**5.00c**
Steel bars, Detroit	4.50c
Steel bars, Philadelphia	5.00c to 5.50c
Steel bars, New York	4.75c to 5.00c
Steel bars, St. Louis	4.55c
Steel bars, Cincinnati	**5.00c**
Steel bars, St. Paul	4.60c
Steel bars, Buffalo	4.60c to 5.10c
Iron bars, Chicago	4.50c
Iron bars, Cleveland	**4.95c**
Iron bars, Detroit	4.50c
Iron bars, St. Louis	4.45c
Iron bars, Cincinnati	**5.00c**
Iron bars, Philadelphia	5.20c
Iron bars, New York	5.00c
Shapes, Chicago	5.00c
Shapes, Detroit	5.00c
Shapes, St. Louis	5.05c
Shapes, St. Paul	5.10c
Shapes, New York	5.00c to 5.25c
Shapes, Cleveland	**5.25c**
Shapes, Philadelphia	5.00c to 5.50c
Shapes, Buffalo	5.10c to 5.35c
Shapes, Cincinnati	**5.25c**
Plates, Chicago	7.00c to 10.00c
Plates, Detroit	**9.00c to 10.00c**
Plates, St. Louis	7.05c to 7.55c
Plates, St. Paul	**7.10c**
Plates, New York	8.00c to 9.00c
Plates, Cleveland	10.00c
Plates, Philadelphia	10.00c
Plates, Cincinnati	10.00c
No. 10 blue anl. sheets, Chi.	9.50c to 10.00c
No. 10 blue anl. sheets, Cleve.	9.50c to 10.00c
No. 10 blue anl., Buffalo	11.00c to 11.75c
No. 10 blue anl., sheets, St. L.	10.05c
No. 10 blue anl. sheets, Cinci.	10.00c
No. 10 blue anl. sheets, St. Paul	9.60c
No. 10 blue anl. sh., Detroit	9.50c
No. 28 black sheets, Chgo.	9.50c to 10.00c
No. 28 black sheets, Cleve.	9.50c to 10.00c
No. 28 black sheets, Cincin.	8.65c
No. 28 black, Detroit	**9.50c**
No. 28 black sheets, St. L.	10.35c
No. 28 black sheets, St. Paul	9.60c
No. 28 galv. sheets, Chgo.	11.00c to 11.50c
No. 28 galv. sheets, Cleve.	11.00c
No. 28 galv. sheets, Cincin.	10.65c
No. 28 galvanized, Detroit	11.00c
No. 28 galv. sheets, St. L.	11.50c to 11.75c
Hoops, Cleveland	6.00c
Hoops, Detroit	**7.00c**

IRON AND STEEL SCRAP

STEEL WORKS USE

(Gross Tons)

Bundled sheets, Pittsburgh	$25.00 to 27.00
Bundled sheets, Cleveland	32.50 to 33.50
Bundled sheets, Buffalo	20.00 to 21.00
City wrought, short, N. Y.	27.00 to 28.00
Frogs, switches, guards, St. L.	32.00 to 33.00
Heavy melting steel, Pitts.	38.00 to 40.00
Heavy melting steel, Buffalo	33.00 to 34.00
Heavy melting steel, Chgo.	33.50 to 34.00
Heavy melt'g steel, Cleveland	35.00 to 36.00
Heavy melting steel, Cinci.	31.50 to 32.00
Heavy melting steel, east. Pa.	32.50 to 33.50
Heavy melting steel, N. Y.	27.00 to 28.00
Heavy melting steel, St. L.	34.00 to 35.00
Heavy melt'g steel, Birming.	19.00 to 20.25
Hydraulic pressed sh'ts, Cleve.	32.00
Hydraulic press. sheets, Pitts.	31.00 to 32.00
Hydraulic pressed sh'ts, Chgo.	26.50 to 27.00
Low phos. steel, Buffalo	45.00 to 48.00
Low phos. steel, Pittsburgh	45.00 to 50.00
Low phos. steel, eastern Pa.	40.00 to 45.00
Shoveling steel, Chicago	31.50 to 32.00
Shoveling steel, St. Louis	29.00 to 30.00
Steel rails, short, Chicago	38.50 to 39.50
Steel rails, short, Cleveland	37.00 to 38.00
Steel rails, short, St. Louis	40.00 to 41.00
Steel rails, old, Birmingham	25.00 to 26.00
Stove plate, Cincinnati	17.50 to 18.00
Stove plate, St. Louis	17.00 to 17.50
Stove plate, N. J. points	21.00 to 21.50
Stove plate, Birmingham	15.00 to 16.00
Stove plate, Buffalo	21.00 to 22.00
Stove plate, eastern Pa.	21.00 to 22.00
Stove plate, Pittsburgh	23.00 to 23.50

(Net Tons)

Boiler plate, cut, No. 1, Chgo.	$20.00 to 21.00
Boiler plate, cut, No. 1, St. L.	19.50 to 20.00
Bundled sheets, Cincinnati	17.50 to 18.00
Knuckles, coup., Chicago	39.00 to 40.00
Knuckles, coup., St. Louis	41.00 to 42.00
Springs, Chicago	44.00 to 45.00
Stove plate, Chicago	18.00 to 19.00
Stove plate, Cleveland	20.50 to 21.50

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$0.95
Newark, N. J.	3.50
Boston	3.70
Philadelphia	3.30
Pittsburgh	.95
St. Louis	3.18
Minneapolis, St. Paul	4.54
Buffalo to:	
Albany, N. Y.	$1.26
New England (rail)	3.10
New York and Brooklyn (rail)	3.10
Virginia furnaces to:	
Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York dock (r. and w.)	2.88
Birmingham, Ala., to:	
Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
Minneapolis, St. Paul	5.85
New York (r. and w.)	4.25
Philadelphia (r. and w.)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75
St. Louis	3.40
Chicago to:	
Des Moines	$2.80
Milwaukee	.50
Minneapolis, St. Paul	2.00
Moline, Ill.	1.40
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58
Minneapolis, St. Paul	4.54
Duluth, Minn., to:	
Minneapolis-St. Paul	$1.25
Mayville, Wis.:	
Minneapolis-St. Paul	$1.75

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	19.5 cents
Philadelphia	18.5 cents
Boston	21.5 cents
Buffalo	11.6 cents
Baltimore	18.0 cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Detroit	15.7 cents
Minneapolis and St. Paul	32.9 cents
Denver	76.1 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast (all rail)	73.9 cents
Pacific coast (tin plate)	70 cents
Pacific coast, via Panama	61.0 cents

IRON MILL USE

(Gross Tons)

Busheling, No. 1, Buffalo	28.00 to 29.00
Busheling, No. 2, Buffalo	18.00 to 19.00
Busheling, No. 1, Pittsburgh	25.00 to 27.00
Cast borings, New York	19.00
Cast borings, eastern Pa.	21.00 to 22.00
Cast borings, Buffalo	20.00 to 21.00
Cast borings, Pittsburgh	22.50 to 23.00
City wrought, long, N. Y.	33.00 to 34.00
Forge flashings, small, Cleve.	29.00 to 29.50
Forge flashings, large, Cleve.	26.00 to 27.00
Forge, No. 1, eastern Pa.	21.50 to 22.50
Grate bars, Buffalo	20.00 to 21.00
Grate bars, N. J. points	19.00 to 19.50
Iron axles, Pittsburgh	50.00 to 52.00
Iron axles, Cincinnati	44.50 to 45.00
Iron axles, eastern Pa.	50.00 to 55.00
Iron axles, Buffalo	45.00 to 50.00
Iron rails, Chicago	42.00 to 43.00
Iron rails, Buffalo	43.00 to 44.00
Iron rails, Cincinnati	34.50 to 35.00
Iron rails, St. Louis	40.50 to 41.50
Iron rails, Cleveland	42.50 to 43.50
Machine turnings, Buffalo	$18.00 to 19.00
Machine shop turnings, N. Y.	19.50
Mach. shop turnings, Pitts.	22.00 to 22.50
Mch. shop turnings, east. Pa.	19.00
Machine turnings, Birming.	11.00 to 12.00
R. R. mch. cast, No. 1, Buff.	30.00 to 31.00
R. R. wrought, 1, Buffalo	43.00 to 45.00
R. R. wrgt., No. 1, east. Pa.	43.00 to 47.00
R. R. wrought, No. 1, Pitts.	43.00 to 44.00
R. R. wrought, 1, B'ham	26.00 to 27.00
Wrought pipe, Buffalo	29.00 to 30.00
Wrought pipe, eastern Pa.	30.00 to 32.00
Wrought pipe, New York	27.00 to 28.00

(Net Tons)

Angle bars, iron, Chicago	$38.00 to 38.50
Angle bars, steel, St. Louis	30.00 to 31.00
Arch bars & transoms, St. L.	40.00 to 41.00
Arch bars & transoms, Chgo.	40.00 to 41.00
Busheling, No. 1, Chicago	27.50 to 28.00
Busheling, No. 1, Cincinnati	21.50 to 22.00
Busheling, No. 1, Cleveland	27.00 to 28.00
Busheling, No. 1, St. Louis	24.50 to 25.00
Busheling, No. 2, Chicago	20.00 to 20.50
Cast borings, Cincinnati	15.00 to 15.50
Cast borings, Cleveland	18.00 to 18.50
Cast borings, St. Louis	15.50 to 16.00
Cast borings, Chicago	16.00 to 17.00
Cut forge, Chicago	32.00 to 33.00
Grate bars, Cleveland	21.00 to 22.00
Iron axles, St. Louis	44.00 to 45.00
Iron axles, Chicago	44.00 to 45.00
Iron axles, Cleveland	46.50 to 47.00
Machine shop turnings, Chgo.	17.00 to 18.00
Mach. shop turnings, Cleve.	17.50 to 18.00
Machine shop turn'gs, Cinci.	13.50 to 14.00
Mach. shop turnings, St. L.	16.50 to 17.00
Pipes and flues, Cleveland	23.50 to 24.00
Pipes and flues, Chicago	24.50 to 25.00
Pipes and flues, St. Louis	20.00 to 20.50
Railroad wrought, 1, Cleve.	40.50 to 41.50
Railroad wrgt., No. 1, Chgo.	36.00 to 37.00
Railroad wrought, 1, Cinci.	34.00 to 34.50
Railroad wrought, 1, St. L.	34.00 to 35.00
Railroad wrgt., No. 2, Chgo.	33.00 to 34.00
Railroad wrought, 2, St. L.	32.00 to 30.00

IRON OR STEEL WORKS USE

(Gross Tons)

Axle turnings, Cleveland	$28.00 to 29.00
Axle turnings, Buffalo	26.00 to 27.00
Shafting, New York	41.00
Shafting, eastern Pa.	45.00 to 47.00
Steel car axles, Birmingham	32.00 to 33.00
Steel car axles, New York	54.00
Steel car axles, Buffalo	45.00 to 50.00
Steel car axles, Cleveland	50.00 to 51.00
Steel car axles, Pittsburgh	50.00 to 52.00
Steel car axles, eastern Pa.	50.00 to 55.00

(Net Tons)

Shafting, St. Louis	40.00 to 41.00
Steel car axles, St. Louis	44.00 to 45.00
Steel car axles, Chicago	43.00 to 44.00

IRON FOUNDRY USE

(Gross Tons)

Car wheels, (iron), Pitts.	$33.00 to 34.00
Car wheels, (steel), Pitts.	40.00 to 41.00
Car wheels, Chicago	31.00 to 32.00
Car wheels, eastern Pa.	36.00 to 38.00
Car wheels, Buffalo	35.00 to 36.00
Car wheels, New York	33.00 to 34.00
Car wheels, St. Louis	31.00 to 31.50
Car wheels, Birmingham	23.00 to 24.00
Car wheels, Cleveland	30.50 to 31.50
Tram car wheels, Birming.	20.00 to 21.00
Cast, No. 1, Birmingham	20.00 to 21.50
Cast, 1, machy., N. J. points	38.00
Cast, 1, heavy, N. J. points	34.00 to 35.00
Cast, No. 1, eastern Pa.	33.00 to 34.00
Cast, No. 1, Pittsburgh	33.00 to 34.00
Malleable railroad, Cincinnati	26.00 to 26.50
Malleable railroad, Cleveland	36.00 to 37.00
Malleable railroad, Buffalo	33.00 to 34.00
Malleable railroad, Pittsburgh	31.00 to 33.00
Malleable railroad, east. Pa.	32.00 to 34.00

(Net Tons)

Cast No. 1, Cleveland	27.00 to 28.00
Cast, No. 1, Chicago	26.00 to 27.00
Cast, No. 1, Cincinnati	24.00 to 24.50
Cast, No. 1, St. Louis	24.00 to 25.00
Malleable railroad, Chicago	32.50 to 33.50
Malleable railroad, St. Louis	27.00 to 27.50
Malleable agricultural, Chgo.	25.50 to 26.50

MISCELLANEOUS USES

(Gross Tons)

Reroll. rails, 5 ft. & ov., Pitts.	$45.00
Reroll. rails, 5 ft. & ov., Chgo.	43.00 to 44.00
Reroll. rails, 5 ft. & ov., E. Pa.	43.00 to 45.00
Reroll. rails, 5 ft. & ov., St. L.	42.00 to 43.00
Reroll. rails, 5 ft. or ov., Cleve.	42.00 to 43.00
Rerolling rails, long, Birming.	37.50 to 38.50

(Net Tons)

Boiler punchings, Chicago	35.00 to 36.00
Locomotive tires, Chicago	43.00 to 44.00
Locomotive tires, St. Louis	47.00 to 48.00